THE BRITISH JOURNAL

OF

OPHTHALMOLOGY

JULY, 1932

COMMUNICATIONS

UNI-OCULAR ZONULAR CATARACT*

BY

FRANK W. LAW

LONDON

IN a paper entitled "The Aetiology of Lamellar Cataract," read before the North of England Ophthalmological Society at Liverpool in April, 1920, Treacher Collins makes the stimulating statement: "It is very desirable that a larger number of cases of Unilateral Lamellar Cataract should be collected and analysed..... it would seem that when only one eye is affected some local cause can be discovered to which the condition can be attributed, such as an injury or an attack of inflammation." It is in an attempt to prove my contention that the tentative suggestion made in the latter part of his statement is true that I have investigated the condition; it is because the term lamellar cataract has come to convey to the minds of most ophthalmologists a definite phenomenon with an accepted aetiology that I have adopted the alternative adjective zonular to express what I believe to be a separate clinical entity.

Literature

An important attempt to collect and review the existing knowledge on this subject was made by Walter in 1917; he described

* A Thesis approved for the degree of Doctor of Medicine in the University of Cambridge, January, 1932.

the condition as extremely rare, and the opportunity to follow the devolopment of zonular cataract as even rarer. He refers to cases described by von Graefe, Leber, Vossius, Weiss, Stein, and others. I have consulted those original papers which are truly relevant to the subject, and will discuss them in detail later.

Walter objects to Ruhwandl's query as to the accuracy of the histories in such cases—the latter tends to disregard the importance of the factor of injury. While agreeing with Ruhwandl as to cases of bilateral cataract, he disagrees that in every case of uni-ocular zonular cataract there was present a congenital cataract before the injury, and suggests that a one-sided zonular cataract may follow trauma, and that new transparent lens fibres are laid down subsequently over the opacity.

This idea is supported by many described cases. von Graefe in 1857, in considering the formation of zonular cataract in traumatic dislocation of the lens, describes three cases. The first refers to a boy of 19 who, 8 years previously, had sustained an injury to his right eye from a blunt cross-bow bolt. The lens was dislocated upwards and inwards, and in this region projected forwards so as to bulge the iris locally. On maximal dilatation of the pupil the lens was found to possess an opacity similar in appearance to a lamellar cataract; moreover, the condition remained stationary through the several months that the patient was under observation.

The second case provided the opportunity of following the devolopment of the opacity, as the patient was seen a few days after a contusion to the eye, with traumatic iridodialysis and hyphaema. As soon as the lens was visible it was noticed to be dislocated and a cataract was in process of formation. In a few weeks this attained the appearance of a typical lamellar cataract, after which the condition remained quite stationary.

The third case was seen 10 years after the injury; again the lens was dislocated, and showed a peripheral, perfectly transparent zone, within which was an opaque region through which a clear central interval could be made out. von Graefe notes here that the equator of the lens was angular — "polygonal" — not showing the natural curve, and explains the phenomenon by the observation that the zonula was not torn in spite of the subluxation, and that it exerted an irregular traction upon the periphery of the lens.

A similar case was described by Merz-Weigandt in 1900; here a man, aged 31 years, had sustained a blow on the eye from the knot of a leather whip, and a hyphaema followed. Gradual failure of vision ensued, and 4 years later the appearance of a "typical lamellar cataract" was presented. The importance of the case from a medico-legal point of view is stressed, and the fact

is noted that before the accident the patient was a first-class marksman in the army.

Weiss in 1902, in a paper on the subject, referred to von Graefe's cases, and also to a case of Vossius which the latter had needled for myopia; there followed the formation of a nuclear or lamellar cataract. He remarks upon the similarity of a case of his own, with the difference that in his case there was a nuclear opacity, and two lamellae of opacity, formed in the lens of a boy, aged 18 years, who had sustained an injury to the eye which dislocated the lens. Weiss considered that the injury to the capsule from the dislocation caused the nuclear opacity, and that transparent lens fibres were then laid down over this; he is at a loss to explain the later formation of two concentric lamellae of opacity.

Five cases of unilateral perinuclear cataract were described by Stein in 1904. The first differs from cases already described in that the injury, in a boy, aged 11 years, was a perforating one, through the sclera. A copper foreign body was removed from the vitreous, and the lens was subsequently noted to be clear. Twelve days after the injury a diffuse central clouding was seen in the lens, bounded by a well-marked curved line laterally, while medially the lens was obscured by many small wart-like excrescences, giving it a toothed appearance, especially distinct in the region of the wound. These are of especial interest in that they resemble the appearance presented in my Case I, and may be susceptible of a similar explanation to that put forward in my description. Clear lens matter was present outside the zone of opacity; from the description it would appear that the central interval presented an appearance very similar to that described in my Case II.

Stein's second case presented a perinuclear cataract estimated at 8-9 mm. in diameter, which was revealed after optical iridectomy in a girl, aged 14 years; the operation was undertaken for a vascularised opacity of the lower half of the cornea, with anterior synechia, which followed an attack of inflammation at the age of 4 years. A case with a similar history, seen at the age of 16 years, showed a very imperfect lamellar opacity, which would appear to have some connection with an anterior polar cataract which was present in the eye; this condition was also present in the previous case, but no connection was noted between the two opaque zones. It is possible that in each case the anterior opacity represents the direct, and the lamellar opacity the indirect, result of an affection in early life of the cornea which was perforated at one stage.

The fourth case described by this writer sustained a blow to the left eye at the age of 12 years, before which the eye was reputedly normal; the injury was followed by a white spot, the size of a pin's head, in the pupil, with no impairment of vision. After

the receipt of a second injury 10 months before examination at the age of 20 years, the white spot grew in size and vision deteriorated. Stein described what can only be assumed to be persistent pupillary membrane, between the insertion of two threads of which was a capsular opacity; this was connected to a disc-like perinuclear cataract, surrounded by an irregular annular opacity. Peripherally, the lens was clear. The rather obscure history complicates the elucidation of the findings; it may be that the capsular opacity was an ordinary congenital polar cataract and the perinuclear opacity a traumatic zonular cataract, or alternatively that the anterior cataract was a capsular "imprint" of a cataract for which the trauma was entirely responsible. The existence of persistent pupillary membrane makes the first explanation more probable; it is quite possible that the first injury was trivial and actually caused no opacity of the subcapsular region of the lens, but that the second was entirely responsible for this.

His fifth case is unimportant in that, although an interesting condition of perinuclear cataract surrounded by a second layer of clouding in one eye only is described, there is no previous history given, and no explanation of the condition is volunteered.

Three other cases which appear to be similar have come to light. One, described by Marcus Gunn in 1895, presented himself at the age of 44 years having sustained a blow to the eye 20 years or more before. There was a rupture of the iris, and the lens was dislocated up and in; in the lens was to be seen a zonular opacity. Gunn states that the opaque zone when he examined the case was smaller than it was soon after its causation on account of compression by the lens matter laid on externally. This may be a statement made from previous experience, or merely a surmise, since there was obviously no chance of observing it as a fact in this particular case.

Mayou gives a very short description of the case of a man, aged 32 years, who sustained a "black eye" at the age of 9 years, there being no other relevant history. As far as one can gather from the description, the opacity found was zonular, though it would appear to have been more marked in, if not actually limited to, the inner quadrant. The margin was well defined and the opacity was covered by clear lens matter.

Finally, Collins in 1916 described the case of a girl, aged 9 years, whose right eye had been injured at birth; the injury had also caused some cervical deformity which had demanded operative remedy. There was, again, no history of fits or rickets, and the teeth were sound. The lens showed a grey semi-opaque zone, well defined laterally, though the vision was not much affected. Collins notes eccentric dilatation of the pupil, and also that the zone appeared to be eccentric in the lens; both of these observations suggest very strongly that it was rather the lens itself which was

the eccentric factor, which would bring the case into line with many others here described. On account, amongst other things, of the persistence of pupillary membrane in the eye, Collins considers the possibility of the opacity being due to a developmental defect; he finally, however, rejects that idea and offers an explanation compatible with that which I shall bring forward to cover all these cases.

Clinical

My personal observations of this extremely rare condition are limited to six cases. I have had access to notes of two further cases, patients at the Royal London Ophthalmic Hospital, which describe a condition so apparently similar that the inclusion of these cases is justified.

Case I.—M. W., a woman, aged 33 years, gave a history of having fallen heavily at the age of 5 years, striking the left side of her forehead; the superficial injury necessitated skin suture. There was no history of convulsions, fits, or rickets. Not until the age of 10 years was any visual affection noticed by the patient, when it was remarked that the left vision was worse than the right. She attended a General Hospital where glasses were prescribed; feeling that these were of no benefit to her, she came to the Royal London Ophthalmic Hospital in 1928, complaining of defective vision in the left eye. Vision was found to be R. 6/6 partly; L. 6/24. In spite of her statement to the contrary, the use of her glasses (R. + 1·0 D.S. $\bar{c}$ + 0·25 D.C. → 180°. L. + 4·5 D.S. $\bar{c}$ + 0·5 D.C. → 150°) enabled her to obtain 6/5 with the right eye and 6/12 partly with the left.

The pupils were active and tension normal. Homatropine and cocaine produced normal dilatation of the right pupil, and full examination showed this eye to be normal; poor dilatation of the left pupil resulted. There was no sign of a perforating injury; some congenital pigment was found on the anterior lens capsule, and a slight degree of atrophy of the iris margin was noted at "2 o'clock"; it is possible that this represented the site of the main point of injury (cf. Case II).

The lens was subluxated to a slight degree, upwards and inwards. A zone of opacity occupied the lens, placed concentrically in it and covered by clear cortex except at an area corresponding to the site of iris atrophy, where for a small part of the circumference the cortex was stippled with opaque dots. The opacity was seen only in the lower, outer, and part of the upper quadrants; it was difficult to decide whether or not the circle was completed in the rest of the circumference by an extremely faint line of

opacity. Again corresponding to the point of iris atrophy was a large dense opacity in the periphery of the affected zone; elsewhere it was composed of striae and stippled areas, while peripherally below was a very regular line of cuneiform opacities, between which opaque lens fibres were very plainly seen. It is suggested, by the regularity of these peripheral opacities, that they represent the result of the tearing off of bundles of fibres of the suspensory ligament. The zone of opacity was occupied by a central clear interval, in which the anterior and posterior sutures were clearly seen.

Case II.—I. G.—A very instructive case, which I showed before the Ophthalmological Section of the Royal Society of Medicine in October, 1930, having first seen her in March of that year, and again at intervals until May, 1931, during which time I have observed no change in the lens. There was no history of rickets, nor of the occurrence of any fits or convulsions in infancy; the patient, a girl, aged 14 years, is one of a family of 9, all healthy, and is described as a very healthy child; she sustained a non-perforating injury of the left eye 5 years ago from a twig. The vision of the left eye was noted to be somewhat defective 3 years ago; as far as the patient can judge, there has been no change in either direction since then.

The right eye had 6/5 vision, was emmetropic, and appeared normal in all respects; there were many strands and fibrillae visible in the vitreous on microscopical examination, which were almost certainly normal. The left vision was less than 6/60, the pupil circular and active, and the tension normal. The pupil dilated well with a mydriatic, and revealed a shell of opacity in the lens; at about "6.30 o'clock," on the peripheral part of the anterior capsule, was some iris pigment which at one point was continuous with the iris, forming a fine pigment synechia.

Clear peripheral cortex was seen in every position except down and out, where the shell of opacity extended past the fully dilated pupillary border; the impression given was that the opacity was situated concentrically in the lens, and that the whole lens was dislocated, to a very slight degree downwards and outwards. The opacity consisted of anterior and posterior lamellae; the anterior lamella was densest down and in, whereas the posterior varied in density irregularly over its area. The edge where visible, was quite clean-cut, and no riders were present; the cortex of the lens outside this edge was everywhere clear except in a position corresponding to the point where iris pigment was found on the lens capsule. It is suggested that the pigment disturbance was due to the original injury and represented the site of reception of greatest injury; at this point, and at this point only, was the

cortex of the lens outside the main opacity affected—a precisely similar state of affairs to that described in Case I.

The cataract, in its anterior lamella, consisted of dense cumuli of opacity with striae below, with outlying opaque areas, less dense, extending round the periphery, and centrally, from this area. Upwards and outwards there was practically no opacity to be seen, except where the two lamellae joined to form the well-defined boundary; in the dense area opposed to this was an optical appearance practically identical with lamellar separation, which Koby describes as indicating hydration of the lens, but is usually regarded as a senile phenomenon. The posterior lamella consisted again of cumuli, here most marked up and out, and tending to fade away down and in. The central interval was not optically empty but was occupied by fine short spicules of opacity set irregularly throughout the space; the anterior Y suture was identified with ease, but the posterior could not be traced.

Examination of the parts of the eye posterior to the lens, so far as this was possible, revealed no abnormality.

Case III.—J. L. a child, aged 4 years, with no history of birth injury or other trauma, nor of any relevant disease, was brought to the Royal London Ophthalmic Hospital because her parents noticed that the left eye tended to turn up and out. The child was one of twins, the brother being apparently quite normal.

The media of the right eye were perfectly clear and the eye appeared normal in all respects. The left lens showed a centrally placed opacity covered by clear cortex; this opacity, as far as could be ascertained, certainly gave the impression of being composed of a "shell" like a lamellar cataract; but owing to the age and disposition of the patient, detailed examination was difficult, and microscopy impossible. The outline of the opacity, while clear cut, was irregular; the surface was also irregular, and the opacity had a "cracked ice" appearance, of varying density in different areas. There was also a posterior cortical opacity of a vague stellate shape, which appeared to be not entirely separated from the posterior lamella of opacity. The lamellar opacity (if such it was) in this case was of a much smaller size than in the two preceding cases; this is consistent with the disparity in the ages of the patients.

Case IV.—L.S. was first brought to the Royal London Ophthalmic Hospital at the age of 6 years, in November, 1929. The boy is in the charge of an Orphans' Institution and it is impossible to obtain a detailed history; nevertheless, it is clear that "something happened" to the child at the age of 2 years, and that at some subsequent stage an abnormality of the right eye was noticed, for

which he was brought to hospital. At that time the right eye was noted to be convergent and cataractous.

I saw the patient myself for the first time in April, 1931. The left eye, apart from a low degree of hypermetropia, was normal. The right eye was externally normal, no scar or other evidence of injury being visible, the pupil active, and the tension normal. The pupil dilated circularly and well with homatropine and cocaine, and revealed a zonular opacity of the lens. The size of the opacity was such that there was a narrow ring of clear red reflex between it and the fully dilated pupillary margin. There was no sign of dislocation of the lens.

The edge of the opacity was very irregular, and not so sharply defined as in some of the other cases; at irregular intervals round it were projections into the overlying lens substance, which projections bore a vague resemblance to the riders of a lamellar cataract. The opacity itself was mainly striate, with woolly patches interspersed between the radiate striae; apart from a few very fine spicules, the thin layer of cortex overlying the cataract was clear. The opacity was dense enough to make it impossible to see the anterior Y or to determine whether there was a central clear interval; and to this extent it may be objected that the term zonular is probably a misnomer; be that as it may, the important fact of a superjacent clear cortex is established. No further abnormality of this eye was noted.

In spite of repeated enquires, no relevant medical history was forthcoming; the boy's teeth were normal in appearance. The first impression gained from a macroscopic view of this opacity was that it belonged to that class associated with hyaloid remains, and this must be borne in mind as a possible alternative diagnosis; nevertheless, after microscopy and full consideration, I am fairly confident that the case resembles in its mode of origin the others in this series.

Case V.—C. D., was brought to hospital in June, 1930, being then a boy aged 1½ years. The history was that the parents had noticed a mist over the left eye for eight weeks; "the pupil had begun to go white," and the first sign of this had occurred six weeks after a serious fall which, according to the story, had severely damaged the patient's nose. The mother—an intelligent person—was quite sure that no sign of this whiteness was present before the accident, and was equally sure that both eyes had good vision; since the fall, she had on occasion tied up the right eye and satisfied herself that the vision of the left was defective.

On examination after mydriasis, which was full and circular in each eye, the right eye was found to be normal. The left showed an opacity of the lens, situated in the central part, concentrically;

there was apparently no dislocation of the lens. Slit-lamp microscopy was impossible. Examination with the loupe showed the opacity to be zonular in type. The posterior lamella was by far the denser of the two; nasally it was composed of a layer of cloudy opacity of regular density, while temporally it was more irregular, resembling rather, secondary cataract in appearance. The anterior lamella was very thin, and, indeed, appeared to be incomplete temporally; I have no doubt, however, that the microscope would have revealed a very faint layer of opacity, completing the zone. At three points round the periphery there were striate opacities resembling the riders of a lamellar cataract, though much more irregular in disposition and arrangement; at one point there was one rider, at the others two. They were of particular interest because of the ease with which two of them could be seen actually "riding" the lamellae, being staple-shaped opacities, lying in clear cortex in the antero-posterior plane; it is rarely one has the opportunity of so readily verifying the aptness of the term applied to these opacities. A similar appearance was noted by Stein in 1904, in examining a case of complicated cataract in a girl, aged 16 years.

The central interval of this cataract appeared clear, and there was a layer of clear cortex covering the whole; a good peripheral reflex was obtained in which the riders showed clearly. The fundus was apparently normal, though minute examination was difficult. I have examined this boy a year after his first visit and can see no change in the appearance of the opacity; it is of course impossible to measure the depth of clear cortex covering the cataract, though I have no doubt but that it is greater than it was a year ago.

Case VI.—F. B., a male nurse, aged 35 years, attended hospital on June 10, 1931, bearing a letter from his temporary employers requesting an opinion as to whether the cataract in his right eye was likely to be followed by a similar occurrence on the left, in view of his impending appointment to a permanent post. The fact that he was a regular soldier until 12 years ago proves that the cataract had formed since that period; he had passed all his medical examinations, and became a first-class marksman, shooting from his right shoulder. Eight years ago he was thrown on to the point of his chin in a road accident and was unconscious for a short time. Three or four years ago a foreign body in his left eye drew his attention to the fact, for the first time, that his right vision was defective; he has carefully noted that since that time there has been no increase in the density of the "film" over his right eye.

The left eye showed, on examination, no abnormality of any kind, and vision was 6/5. Right vision was down to counting

fingers at half a metre; the pupil was active, and tension normal. Full circular dilatation of the pupil occurred under the influence of a mydriatic, and revealed a diffuse clouding of the central part of the lens; this was poorly demarcated from the superficial lens matter, and, although not so dense in its centre as more externally, could not in any sense be described as possessing a clear central interval. In this respect the opacity was certainly not truly zonular in type, there being but a faint indication of this kind of structure by the slightly less dense central interval; it is highly probable that the comparatively advanced age of the patient at the time of the receipt of injury was responsible for this. The opacity was covered by a much more nearly clear cortex, consisting only of a very thin shell; again his age may be invoked to explain this. There were small radiate peripheral opacities in this cortex, somewhat suggestive of riders. The anterior Y was well seen, enabling measurements to be made; a good annular reflex was obtained, and a very limited view of an apparently normal fundus.

I have had access to the notes of two other cases of uni-ocular zonular cataract. The first describe the case of a male infant, aged 7 months, in August, 1925, whose right eye had been noticed to be cataractous for two weeks. There was no history of birth trauma or other injury, but the child had had a very bad attack of whooping cough 3 months previously. The right lens showed an irregular opacity, dense in parts, less dense in others; below these were opacities in the "cortex" suggestive of atypical riders. The appearance was then described as that of an "Atypical unilateral lamellar cataract;" the left eye was quite clear. On examination in February, 1926, the opacity was noted to be denser in the centre, the "cortex" being still clear; the left eye was normal.

The other notes referred to a boy who was aged 16 years when first examined in June, 1928. Again the patient was one of twins; no forceps had been used at birth, but there was a vague history of convulsions at the age of 1 day; the baby had been very small and backward and had been thought to be moribund on occasions. When examined in hospital, the left media were clear, and vision was 6/6; the right eye was described as possessing a "lamellar cataract denser on the temporal side;" vision in the eye, with a −9·0 D. sphere, was 3/60.

As indicated in the opening paragraph, it is my endeavour in this paper to establish the fact that a uni-ocular zonular cataract has an origin entirely distinct from that of the common lamellar cataract, and that the factor most probably responsible for it is injury. In this respect it will be apposite to consider a few details of the growth and nutrition of the lens and also, so far as they are known, the aetiology of lamellar cataract and the mode of formation of traumatic cataract.

The Growth and Nutrition of the Lens

Up to the ninth week of intra-uterine life, all the substance of the lens is formed from the cells of the posterior wall of the lens vesicle. These primary fibres, as they are termed, constitute what can be still recognised in the adult lens as the central dark interval. The anterior wall of the lens vesicle persists as the lenticular epithelium; over this, by the 13 mm. stage, is laid down the hyaline capsule, the origin of which is at present not definitely known. By an elongation of the bodies of the cells of the definitive postero-lateral wall, the nuclei of these cells come to occupy an equatorial position; whence are laid down the secondary fibres, overlapping the primary and forming, from the third month until birth, the foetal nucleus. Sutures are found in this and in all subsequent zones of the lens; in their simplest form, that of the anterior and posterior Y, they mark the limit of the foetal nucleus, and at birth are situated immediately subjacent to the capsule. The Y sutures of an adult lens thus indicate the extent of the lens at birth, though probably not the size, for it appears likely that compression of the older parts of the lens occurs as the newer fibres are laid down over them, causing an apparent shrinkage of the foetal nucleus. The fibres laid down from birth to puberty form another zone, referred to as the infantile nucleus; after this time, the adult nucleus is laid down over the preformed layers, and later the superjacent cortex; these are to be considered respectively adult and senile in time of formation.

Growth of the lens, therefore, continues throughout life; knowledge of its pre-natal rate of growth is fairly complete, whereas we are practically uninformed as to the post-natal rate. An important point of difference in the development of the lens from that of other epiblastic structures should be noted. In a structure such as the skin, the oldest part is external, and continuous surface death and loss is replaced by growth of the deeper layers. Since the lens is formed, however, by an involution of surface epiblast—a characteristic which it shares with the dental enamel—its oldest part is internal, and growth occurs by the laying on of fresh lens fibres externally. In the consideration of the aetiology of lamellar cataract this is a point of moment, since it is reasonable to suppose that a morbid condition of the whole organism might be reflected in a similar manner in two separate parts of that organism of similar embryological origin.

The nutrition of the mammalian lens is carried out in its early stages through the medium of its vascular tunic; a rich network of tissues derived from the hyaloid and long ciliary arteries. This fibro-vascular sheath normally disappears before birth, after which disappearance the lens depends for its nutrition primarily upon

the uvea, through the medium of the aqueous and vitreous humours. The metabolism must be carried on by a process of diffusion through the lens capsule, since all investigations have failed to find any support for the theory of the existence of circulatory channels in the lens substance.

It is reasonable to assume that the oxygen content of the aqueous and vitreous is insufficient in itself to carry out the nutrition of the lens; and the lens has been proved to possess certain oxidative enzymes, together with an auto-oxidisable substance glutathione, which make up an internal oxidation system responsible for its nutrition. A derangement of this internal oxidation system is productive of opacities in the lens, the result of denaturation and coagulation of the lens proteins. In this manner the importance of radiant energy in the production of lens opacities can be appreciated, either direct or through an affection of the ciliary body; for in the latter case the aqueous, a product of the ciliary body, will in its turn be affected, causing an upset in the oxidation system—an occurrence seen in its crudest form in the production of complicated cataract. Concomitantly with this, an alteration of capsular permeability will increase the likelihood of opacity formation; and such alteration can be even more readily attributed to trauma than to radiant energy.

Lamellar Cataract

In considering the much discussed question of the aetiology of lamellar cataract—using the term in its conventional sense—one remembers that it was Davidson and Horner who in 1865 first propagated the idea that such a cataract was the result of rickets. Many and varied have been the theories since adduced to account for this comparatively common condition, and it is even now impossible to hold the belief that, except in most general terms, one single cause is responsible for all lamellar cataracts.

Lamellar cataract is a disease of early infancy, and by most writers described as "probably congenital." It consists in the presence in the lens of a layer of opacity situated around a central core, which core often shows fine punctate opacities. There may on rare occasions be two such layers arranged concentrically; the cortex outside is clear, with the exception of the usual presence of the radial "riders," and remains so except in a very small minority of cases in which the opacity has been seen to become complete. The opacity is found in both eyes, to quote the majority of writers, "almost always"; in view of my thesis I would delete the former adverb.

Histologically, the opacity is seen to be caused by interfibrillary globules; fissures are also seen, some of which are manifested

clinically as riders; and irregular circular spaces are found in some cataracts which account for the occasional presence of white dots of greater density than the general opacity. As to size, the average of 10 measurements made by four different observers and quoted by Collins was 4·775 mm.; the average of 10 measurements made ophthalmoscopically by Dub was 4·92 mm. Now the diameter of the lens at birth is about 5·75 mm.—a figure arrived at by many observers and agreed to by most ophthalmologists. It is also agreed that the size of a lamellar cataract is never greater than that of the lens at birth—a point stressed by, amongst others, Parsons, Collins and Dub, and verified by the above figures. Hence it must of necessity follow either that the formation of the lamellar cataract is prenatal in time, or that the zone of opacity at the time of formation is not the most peripheral part of the lens.

In an important paper dealing with the incidence of lamellar cataract and rickets in many parts of the world, Collins in 1892 found good reasons for believing in the inter-relationship of these two diseases; while he disagreed on the whole with the conclusion of Davidson and Horner, he held the opinion that some predisposing condition was to be held responsible for both. The histology of the affected lens suggests that some nutritional or metabolic disturbance would appear to be a likely cause, since the globules found must represent either non-developed lens cells, or lens fibres which, having commenced to develop, have through defective nutrition degenerated; and there is not the slightest evidence of this partial failure of nutrition being due to a local cause. Arlt, on the other hand, noting the frequent occurrence of convulsions in infancy in the subjects of lamellar cataract, propounded a local mechanical explanation of the disease, suggesting that the convulsions caused a loosening of the "nucleus" of the lens from the "cortex," the layer of fibres affected becoming clouded as a result. The presence of such a local cause would seem to me to exclude the opacity from the category altogether, as in a case quoted by Collins of a child, aged 8 months, who had an opaque staphylomatous cornea, the result of ophthalmia neonatorum. He found here, in addition to the much more usual anterior polar cataract, a zonular opacity of the lens, evidently due to mechanical disturbance of nutrition at an early age. Similar cases have been recorded by Becker and Schirmer.

Horner objects to Arlt's theory on the ground that it is proved that the cataract is originally an affection of the whole lens; he quotes an experiment of von Hippel, who subjected rabbits *in utero* to the influence of X-rays, and subsequently watched transparent lens fibres being laid down over a total cataract. Peters, on the other hand, claimed to have watched two lamellar cataracts in the process of formation, and hence believed that an affection of the

nucleus could take place in a sound cortex; he postulated a transference of fluid from nucleus to cortex due to shrinkage of the former. Hess stated, in opposition to this, that the fluid content of nucleus and cortex was the same, and gave, as a possible explanation of the occurrence of lamellar cataract, late closure of the lens vesicle; this is at best, however, a surmise and inapplicable to all cases of cataract formed post-natally. Peters accepts Horner's theory of the one-time totality of a zonular cataract in the case of bilateral congenital cataract, but inclines to the opinion that other types are caused by an alteration of the composition of the aqueous due to an affection of the ciliary body, which prejudices the nourishment of the lens; presumably he infers that the part of the lens farthest from the nutrient medium is affected to a greater extent than, or in contradistinction to, that situated nearer, an idea also subscribed to by Collins. In considering the possibility of this influence, as opposed to that of a general intra-uterine toxic nature, while one is assisted in the explanation of the cause of a traumatic zonular cataract, the question as to the nature and cause of the disturbance of the ciliary body remains unanswered; the fact that lamellar cataracts are bilateral increases the difficulty. On the other hand, the well-known occurrence of the clearing of a posterior cortical traumatic opacity lends support to the argument.

Parsons gives the cause as a period of malnutrition in late intra-uterine or early infantile life. He disagrees on the whole that rickets is the cause; in experiments on rats, nutritional deficiency caused lamellar cataracts but no bony changes, and in older animals rickets was often observed, whereas no lens opacity followed. The diet was deficient in vitamin A, fat and phosphorus, and the parts most obviously affected were those epithelial structures where desquamation does not occur, *i.e.*, the lens and the teeth. Bennett calls lamellar cataract an early infantile disease, due to a derangement of general health; he makes a great point of the simultaneous affection of the lens and teeth, and again indicates their similar embryology. Nettleship, in his masterly study of heredity in connection with eye disease, differentiates between hereditary and non-hereditary cases, and states that in the former class of case, the cataract is just pre-natal in time of formation.

An interesting side light on our knowledge of the aetiology was thrown by Jeremy in 1919, in connection with parathyroid deficiency. He noted the development of a cataract of lamellar type in a patient who had undergone thyroidectomy 3 to 4 years before; cases were quoted in which cataract had followed 6 months (Schiller) and 5½ years (Westphal) after similar operations. Confirmation of the presence of this interconnection was provided by Edmunds (1916), who described the occurrence of cataract after experimental thyroidectomy in a dog.

It will thus be seen that many clinical phenomena—rickets, tetany, hypoplasia of teeth, parathyroid deficiency—have been proved to be associated with the occurrence of lamellar cataract, and that over all the cases hangs the vague shadow referred to as "disturbance of nutrition." What can provide a link to join up all these apparently isolated factors? I suggest that a consideration of calcium metabolism will do this. The influence of nutrition in general and vitamin supply in particular, upon the metabolism of calcium in the young growing organism is accepted; calcium plays an obvious part in the formation of teeth; rickets and tetany are known to be diseases intimately connected with calcium metabolism; and the influence of the parathyroid glands in this direction is also proved. Lamellar cataract is therefore to be looked upon as a manifestation of a disturbance of the metabolism of calcium in the growing organism, be it before or after birth; absence of substances exerting an influence on this metabolism—vitamin A, parathyroid secretion—may cause its appearance; diseases known to be intimately associated with this metabolism—rickets, tetany—are frequently complicated by its appearance.

Traumatic Cataract

The exact mode of formation of opacities in the lens, whether due to traumatic or constitutional influence, is still the subject of research and discussion; we are here concerned only with that group of opacities caused by concussion of the globe. In 1887 Schlösser gave it as his opinion that the opacity caused by non-penetrating injury of the globe was due to a distension of pre-existing lymphatic spaces in the lens, a theory which he claimed to support by experiments upon rabbits. A year later Fuchs described eleven cases of posterior traumatic cataract, and agreed with Schlösser as to the mode of their production. zur Nedden in 1904 produced a contrary theory, to the effect that the lens suffered a movement within its capsule, their connection being thereby severed; by this means fluid gained access to the cement substance and separated the lens fibres. The idea behind this has appealed to many writers; for instance, Friedenwald has lately suggested that the cause is a subcapsular epithelial injury, or an alteration in capsular permeability. One cannot but feel that such a change plays a large part in the pathological process; but it must be added that the first goes no way towards explaining the posterior limited opacities, nor does the second do more than suggest at most the first stage in the process.

Hudson, in a study of posterior traumatic cataract, gave yet another explanation, suggesting that the opacity was due to a

swelling of the lens fibres themselves. He quotes Leber as saying that the latter's researches almost definitely disprove the existence of lymph channels in the lens—a proposition now generally accepted; and rightly adds that Schlösser's hypothesis explains neither the appearance nor the progress of the opacities. As an explanation of the fact that such opacities are usually post-equatorial, he mentions that the posterior capsule is thinner and less resistant than the anterior, providing greater facility for swelling of the lens in that region; moreover, the equatorial fibres are younger and contain more fluid protoplasm, hence their reaction would be expected to be more severe. Rather than blame access of aqueous for the formation of the opacity, Hudson considers that direct concussion of the lens itself is the more probable cause. In an analysis of his cases, I could find only six that suffered non-penetrating injuries, and of these but three were sustained in early life; none of the three cataracts was zonular in type, though it is possible that one, which was removed when the opacity was total, would have gone on to become a cataract of this kind. In 1916 Whiting, studying anterior and posterior cortical traumatic opacities, found nothing to contradict Hudson's hypothesis.

To refer again to Leber's work, an experiment of his may be aptly quoted, in which he removed a small piece of the lens of a rabbit, and examined the lens on the rabbit's death 321 days after. A somewhat shrunken lens showed a scar in the capsule at the site of injury, from which there extended an opaque track to join a central deep opacity; all the periphery of the lens was clear with the exception of the capsular scar and the opaque track. Leber's explanation was that the injury was followed by a total cataract; proliferation of the capsular epithelium made a scar which closed the opening, and clear lens fibres were subsequently laid down over the opaque lens. Another case of this sort was reported by Vossius in 1898, who noted the formation of a nuclear or lamellar cataract after discission for myopia. The opacity of the ring type associated with this writer's name should be mentioned in considering concussion opacities, though it is probable that this is due either to a deposit of iris pigment upon the lens capsule (and this is not a cataract at all) or to transient degenerative changes in the capsular epithelium caused by pressure of the iris; I have never seen a case of this type in which the opacity did not clear completely and permanently.

Bearing in mind the changes in the lens caused by a penetrating injury of the capsule, it does not seem possible to neglect the influence of free access of fluid to the lens in the formation of traumatic cataract in general. At the present stage of knowledge of concussion opacities and their pathology, the most probable

explanation is that excess of fluid gains access to the lens fibres by reason of an alteration in the capsular permeability, such alteration resulting either directly from the injury, or from the severance of the physiological connection between the capsule and the subjacent epithelium and lens fibres. The presence of this fluid, with its salt content, then causes either swelling of the lens fibres, or of the inter-fibrillary cement substance, or both; the spaces between the fibres become filled with coagulum, the fibres degenerate, and, according to the extent of these changes, a partial or total opacity results.

The Aetiology of Uni-ocular Zonular Cataract

In reviewing the foregoing description of some 22 cases of uni-ocular zonular cataract, together with that of the nutrition of the lens, and the suggestions made as to the causative factors in lamellar cataract and traumatic cataract, several points come to notice. The first is the very high percentage of cases in which there is a definite history of non-penetrating injury, sustained at an early age; only two of the injuries were sustained after the age of 20, and the great majority happened before 12 years of age. Only two reports describe the occurrence of a penetrating injury; the one accidental, the other operative. Two further cases were the subjects of severe inflammatory disorder at an early age; one was certainly a perforated corneal ulcer, the other probably.

Of the cases due to non-penetrating injury, as many as half of them are described as having a dislocated lens on the affected side. It is at least possible that some injury occurred to the two solitary cases of which the description is lacking in this respect; it is about equally possible that a minor degree of dislocation of the lens was present in some of those cases in which this phenomenon is not described. But even apart from these surmises, it is justifiable to draw some conclusions as to the aetiology of the condition under review, from a consideration of the reports of the cases as they stand.

In considering lamellar cataract, it is difficult to see why the constitutional derangement responsible for the condition should bring about a unilateral opacity, unless one recalls Arlt's hypothesis; with this mechanical explanation in mind, two facts become clear: first, that a cataract so caused may be justifiably included in the category of traumatic cataracts, and secondly, that it would appear to be an even chance whether the mechanical disturbance to the body as a whole should cause a cataract in one eye or both. I have accepted as evidence of injury, in two quoted cases, the occurrence of very severe whooping cough in a 4 months' infant, and that of convulsions in an infant at the age of one day.

It has been proved by the examination of many cases of concussion cataract, that the injury was sufficient to rupture the lens capsule, enabling fluid to gain free access to the lens; any subsequently formed lens fibres were also subjected to the action of the fluid, and the ordinary type of complete concussion opacity resulted. Bearing in mind the pathology of traumatic cataract previously outlined, one can deduce what would occur if fluid gained access to the lens for a limited period only, subsequent new lens fibres being again laid down under approximately normal conditions. Such an event could result from a temporary alteration in capsular permeability caused by a severance of the physiological connection between the capsule and the lens, with a consequent alteration in its osmotic properties, or—alternatively and rarely—by a perforating capsular injury which subsequently healed. In each of these cases, degenerative changes would occur in the periphery of the lens as then constituted; if an approximation to natural conditions was restored without delay, the nutrition of the central lens fibres would not be disturbed and the fibres laid down subsequently would again be transparent. According to the severity or duration of the alteration in physical properties of the capsule, so would the transparency of the central lens or the younger peripheral fibres be affected to a greater or lesser degree. I have endeavoured in my case descriptions to show how this degree of transparency does vary.

It is in view of the reasonableness of this theory that I have emphasised the high percentage of cases in this series showing dislocation of the lens. Such an eventuality would certainly alter the relations between capsule and lens; a minor degree of dislocation, perhaps clinically undetectable, would also cause an alteration in their relationship; and, by deduction, a disturbance of the lens insufficient to dislocate it may cause, again, a disturbance of an exactly similar nature. It would also seem, from a consideration of my cases I and II, that in addition to a general disturbance of the capsule, there may be a more severe local injury affecting the properties of the capsule permanently, the affection being manifested by a local opacity in the cortex outside the affected zone.

It is necessary to remark briefly upon those cases in the series which do not quite fall into line. The two who suffered a penetrating injury could be included, in view of what has just been said, on general grounds had they both behaved typically; but it will be remembered that the case of intra-ocular foreign body is described as showing the central opacity in twelve days—that is, a zonular opacity appeared as such. Again, von Graefe's second case is similarly atypical since he describes the opacity as assuming in a few weeks the appearance of a typical lamellar cataract. It is difficult at present to see why either a penetrating or a non-

penetrating injury should cause the appearance of an opacity within transparent lens fibres; it is on the other hand easy to see, in the other case, how the periphery of the lens should be rendered opaque, with the subsequent laying down over the opacity of transparent lens fibres. In the two inflammatory cases, it must be assumed that the nutrition of the lens was disturbed either by an alteration in the chemical properties of the aqueous, or that the capsular permeability was altered by a toxic mechanism, or both. It is not safe to draw any conclusions from either of these cases, reported as they are at second hand; after careful consideration of Stein's description I was inclined to doubt whether the use of the term zonular was really justified in either of the cases, though it was as such—"perinuclear"—that he described the opacities.

Conclusions

1. The cause of a uni-ocular zonular cataract is trauma, almost invariably of the non-penetrating variety.

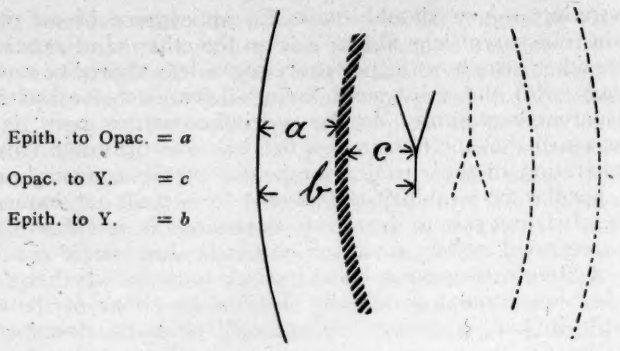
2. The injury is of such kind as to cause a tendency towards dislocation of the lens; in quite half the cases, dislocation actually occurs.

3. The cause of the zonules or lamellae of opacity is a temporary disturbance of the nutrition of the lens, brought about most probably by a severance of physiological connection between lens and capsule, with a consequent alteration in the capsular permeability.

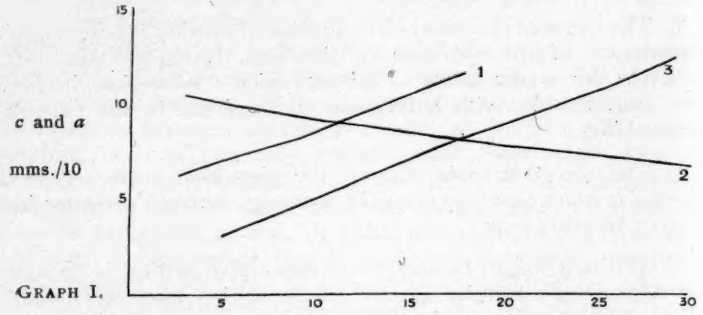
4. The recorded cases support the view that such a type of opacity is more likely to occur in a young, actively growing lens than in an adult lens.

5. While it might be suggested that inflammation is an alternative cause of a zonular opacity, the immediate cause presumably being a chemical or toxic action by the nutrient fluids, such a suggestion finds no support in this investigation.

Postscript.—In examining cases of traumatic zonular cataract one is provided with an important and hitherto unattainable piece of information. It is assumed from what has been said that the zone of opacity occupies, in its inception, the most superficial part of the lens, and that the subsequent laying down of clear lens fibres causes it to occupy an intermediate position; knowing, then, the age at which the injury was received, and measuring the relative position of the opacity, one should be able to deduce the relative

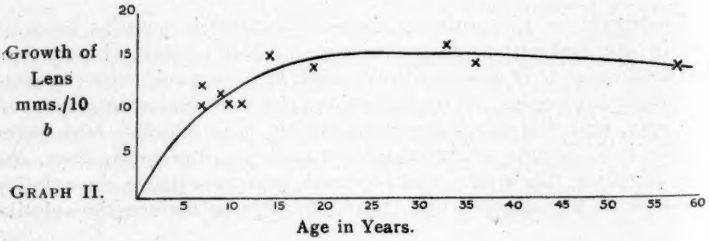


	Age when measured Years	Age at injury Years	a	b mms./10	c	Period a Years	Period c Years
1. Case 2 I. G.	14	9	7	15	8	5	9
2. Case 1 M. W.	33	5	7	17	10	28	5
3. Case 6 F. B.	35	27	4·25	15·75	11·5	8	27



GRAPH I.

Periods, Birth to Injury and Injury to Examination. Years.



GRAPH II.

Age in Years.

or actual post-natal rate of growth of the lens. It was my intention to carry out this investigation with the material at my disposal.

The measurements were made by means of the micrometer drum (Ulbrich) on the binocular microscope of the Gullstrand slit-lamp. The lamp was arranged so that the emerging beam was as nearly axial as possible; the microscope therefore had only to be racked straight forward in order to take the two readings. The beam was first focused (by racking away from the eye) on the epithelium of the lens, the drum thereby remaining at zero; the microscope was then racked forwards till the anterior lamella of the opacity was focused, and a reading was taken; further racking forward focused the anterior Y, and another reading was taken. Three readings were made at each position and the mean taken. These readings gave the actual depths of the zone of opacity, and of the anterior Y, in the lens, in tenths of a millimetre; the error introduced by the refractive media is so small as to fall well within the limits of experimental error and may be disregarded.

My attempt to produce some data in this investigation from which one could generalize as to the post-natal growth of the lens was frustrated. In the first place it was essential that the zonule of opacity should not be so dense as to render impossible the accurate focusing of the anterior Y; in only three of my cases was this condition fulfilled. Of the three remaining cases thus measured, two gave consistent figures, whereas the third was quite incompatible. The possible reasons for this are many; an inaccurate history, a mistake in technique, or an abnormal shape of the lens consequent upon dislocation (a very probable factor) would each render the figures valueless. It is unfortunate that this was the case; the figures obtained are, however, reproduced below for analysis, where the discrepancies shown by Case I will be noticed; these are even more strikingly seen in the graph (I). Owing to the extremely small number of lenses measured, it is not even justifiable to conclude here that the rate of growth of the lens is an individual factor, varying in different cases; a useful conclusion can only be arrived at by measuring many more cases of what is, unfortunately for this investigation, an extremely rare condition.

Graph II is appended to show the result of measuring the distance between the epithelium and the anterior Y in a number of normal lenses.

For access to cases, and to notes of cases, relevant to this investigation, I am indebted to Sir John Herbert Parsons, Mr. F. Juler, Miss Mann, and Mr. R. C. Davenport, of the Royal London Ophthalmic Hospital.

REFERENCES.

Bennett.—*Trans. Ophthal. Soc. U.K.*, Vol. XXI, p. 43, 1901.
Collins.—(1) *Ibid.*, Vol. XL, p. 406; (2) Researches Anat. and Path. of Eye, London, p. 33, 1896; (3) *Trans. Ophthal Soc. U.K.*, Vol. XV, p. 104, 1895; (4) *Ibid.*, Vol. XXXVI, p. 403, 1916.
Dub.—*Archiv f. Ophthal.*, Vol. XXXVII, pp. 4, 26.
Duke-Elder.—Recent Advances in Ophthalmology. London, 2nd Edit., 1929.
Edmunds.—*Proc. Roy. Soc. Med.*, Vol. IX, Pt. 3, p. 53, 1916.
Friedenwald.—Pathology of the Eye. London, 1930.
Fuchs.—(1) Text-book of Ophthalmology. Philadelphia, 8th Edit. (Trans. Duane); (2) Ueber traum. Linsentrubungen. *Wiener klin. Wochenschr.* 1888.
von Graefe.—*Arch. f. Ophthal.*, Vol. III, p. 372, 1857.
Gunn.—*Trans. Ophthal. Soc. U.K.*, Vol. XV, p. 121, 1895.
Horner.—Zur Lehre v. Schichtstaar. *Inaug. Dissert.*, Zürich, 1865.
Hudson.—*Roy. Lond. Ophthal. Hosp. Rep.*, Vol. XVIII, p. 112.
Jeremy.—*Brit. Jl. of Ophthal.*, p. 315, 1919.
Knapp.—*Arch. of Ophthal.*, Vol. XXXV, p. 141.
Leber.—(1) *Berichte d. ophthal. Gesellschaft zu Heidelberg*, p. 33, 1878; (2) *Arch. f. Ophthal.*, Vol. XXVI, pp. 1, 283.
Mann.—Development of Human Eye. Cambridge, 1928.
Mayou.—*Trans. Ophthal. Soc. U.K.*, Vol. XXV, p. 88, 1905.
Merz-Weigandt.—*Cent. f. prakt. Augenheilk.*, Vol. XXIV, p. 353, 1900.
zur Nedden.—*Zeitschr. f. Augenheilk.*, Vol. II, p. 389, 1904.
Nettleship.—Bowman Lecture, 1909. *Trans. Ophthal. Soc. U.K.*, Vol. XXIX.
Parsons.—(1) Pathology of the Eye. London, 1904; (2) Diseases of the Eye. London, 6th Edit., 1931.
Peters.—*Arch. f. Ophthal.*, Vol. XXXIX, p. 221, 1893.
Schiller.—*Beitr. z. klin. Chir.*, Vol. XXIV, p. 586, 1899.
Schirmer.—*Arch. f. Ophthal.*, Vol. XXXV, pp. 3, 147.
Schlösser.—Experim. Studie u. Traum. Kat. München, 1887.
Stein.—*Beitr. z. Augenheilk.*, Vol. VII, Heft. 63, 42, 1904.
Vossius.—*Arch. of Ophthal.*, Vol. XXXV, p. 566, 1906.
Walter.—Ueber traumatischen Schichtstaar. *Inaug. Dissert.*, Rostock, 1917.
Weiss.—*Zeitschr. f. Augenheilk.*, Vol. VIII, p. 37, 1902.
Westphal.—*Berl. klin. Wochenschrift*, Vol. XXXVIII, pp 33, 849, 1901.
Whiting.—*Trans. Ophthal. Soc. U.K.*, Vol. XXXVI, p. 167, 1916.

GLIOMA OF THE OPTIC NERVE

BY

BERNARD GLUCK

CARDIFF

GLIOMATA of the optic nerve are rare, but not excessively so. Surveying the literature up to that date, Hudson[1] in 1912 was able to collect 118 cases which, after reviewing the published reports and where necessary modifying the original diagnosis, he was able to classify as gliomata or probable gliomata. In 1930, Mathewson[2] was able to trace 52 additional cases, so that up to the present less than 200 cases have probably been reported. But in the lifetime of the individual surgeon it is unlikely that more than one or two cases will come under his care; thus, according to

Musial[3], Treacher Collins saw during a period of 15 years in 400,000 patients only 2 cases of primary neoplasm of the optic nerve; Sattler 10 cases in 400,000 patients.

The case here reported has additional interest in two respects:

1. As far as I can trace, it is the first recorded in which radium was used as the primary and only treatment, *i.e.*, without previous removal of the tumour or as much of it as was accessible for removal.

2. The diagnostic problem presented by the case when it was seen early this year and before the previous history could be traced.

D.L., a female child, was admitted to Llwynypia Hospital, Rhondda, on December 26, 1931. The left eye was stated to have been removed 7 years ago after an injury to it by a snowball, and since then the child was said to have had "fits," and for three days before admission to have been unable to swallow.

On admission: the left eyelids, which were entirely devoid of lashes, were completely adherent to each other, the skin passing across the front of the orbit in an unbroken sheet. The orbital contents were tense, fluctuating, but not tender. There was some oedema of the skin but no signs of superficial or deep inflammation. There was loss of nearly all the hairs of the left eyebrow and there appeared to be atrophy of the upper margin of the orbit and superciliary ridge, which could not be felt. The child was clearly mentally backward but quite happy, did not complain of headaches, and no fits were observed until a few days before death.

On January 1, 1932, Mr. Melbourne Thomas, Medical Superintendent, made an incision along the line of the adherent lid-margins. A thick fibrous membrane was exposed and deep to this a thin transparent layer. A needle was passed in and 10 c.c. of clear, deep yellow fluid, which clotted spontaneously, were withdrawn.

On January 5 I was asked to see the child. The cyst had again filled and the whole orbital region was tense and fluctuating. At this stage our diagnosis was a cystic condition of the orbit, probably connected with the removal of the eye, but there were some features which were very puzzling, especially the character of the fluid and the absence of a conjunctival sac if the eye had been removed on account of an injury. Therefore, with a view to determining the limits of the cavity, 35 c.c. of fluid were again aspirated (of similar nature to that previously obtained) and about 2 c.c. of lipiodol injected through the same needle. After removal of the fluid, definite pulsation could be felt in the orbit. X-ray photographs were then taken with the head in several positions. The plates

showed lipiodol well above the roof of the orbit and also behind the apex, in addition to masses in the orbital cavity (Fig. 1).

It was only a few days later that it was possible to trace the notes of her previous treatment, and I am indebted to Mr. Leighton Davies, under whose care she had been, for permission to publish these.

In January, 1925, she was brought to the Cardiff Royal Infirmary on account of being blind in the left eye. This was first noticed a

FIG. 1.

week previously, after being struck on the eye by a snowball. The left eye was blind, disc pale, veins at lower edge full, tortuous and ill-defined in parts. There was no proptosis.

In October of the same year she was brought up again. There was now marked proptosis of the left eye directly forwards; the eye could not be pushed back and there was a sensation of something solid behind the globe; movements were fairly free in all directions. The fundus was as before. The protopsis increased during the next month and the child was admitted with the diagnosis of probable optic nerve tumour.

On November 27, after splitting of outer canthus and resection of external rectus muscle the orbit was explored and a firm mass felt at apex. Complete removal was considered impossible and a needle

of 50 mg. of radium inserted into the orbit to lie against the tumour and left 48 hours. There was considerable reaction with increase of proptosis. From exposure of the cornea an ulcer developed which perforated, so that on the 16th December the eye was enucleated. A firm mass was felt at apex of orbit, extending on to floor and outer wall. Five needles of 50 mg. radium each were inserted into orbit and left for 48 hours. The reaction was moderate except for oedema of the lids, and she was discharged after a week.

On February 11, 1926, she was readmitted. There was swelling of the lids which were slightly cyanotic, the conjunctiva at centre of socket was sloughy, and a hard mass was felt about half way back in orbit. Two needles of 50 mg. radium each were inserted into this mass (some force was required) and left 48 hours. A 'good deal of reaction followed. She was seen several times in out-patients up to May, and again in January, 1927, when the lids were still oedematous and a green slough was seen in socket. This, as far as we can trace, was the last time she attended at the Cardiff Royal Infirmary.

With these notes available, the diagnosis now became fairly clear. There was no change in the child's condition until January 18, when she began to complain of headache and vomited. She became increasingly drowsy and irritable and died on January 22.

Permission for a partial post-mortem only could be obtained and this was carried out by Dr. Roberts, of Llwynypia Hospital, to whom I am much indebted for this and other assistance with the case.

The brain with the dura mater of the floor of the skull, part of the frontal bone and the contents of the left orbit, were removed. The whole roof of the orbit was absent, the atropy of the bone extending up to the superciliary ridge. There was a large cystic growth in the lower part of the left frontal lobe, which extended down to fill the orbit, pushing the dura before it. The dura was not infiltrated by tumour nor was it adherent to the brain. Only towards the apex of the orbit was a small piece of tissue found which appeared to represent the original contents of the orbit. The cavity of the tumour contained lipiodol, none was present in the ventricles. The left lateral ventricle was very greatly enlarged, the right one less so. The tumour extended up to involve the greater part of the lenticular nucleus.

Sections were taken from several parts of the brain tumour and showed the characteristic structure of a glioma (Figs. (2) and (3). It was possible microscopically to identify the stump of the optic nerve in the extra-dural tissue found at the apex of the orbit: astrocyte cells were found within the dural sheath (Fig. 4), but on the whole the tissue here had more the character of neural granulation tissue than of true neoplasm.

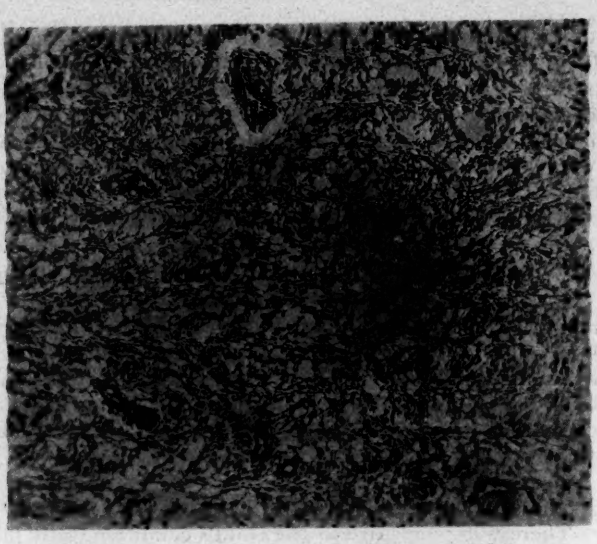


FIG. 2.
Haematoxylin—eosin. ×110

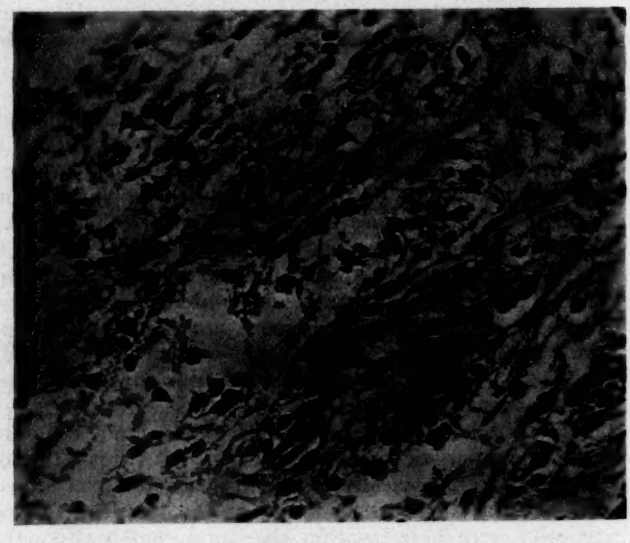


FIG. 3.
Haematoxylin—eosin. × 400

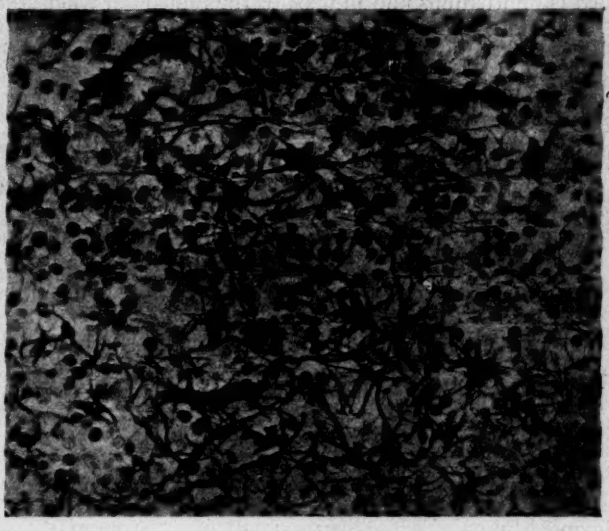


FIG. 4.

The clinical features of primary tumours of the optic nerve have been well summarised by Hudson[1] in an exhaustive paper published in 1912 in which he collected all the previously reported cases. From a critical examination of the records he was able to classify the cases into three groups, of which gliomata formed by far the largest. Of 181 cases collected, 21 could not be classified with any degree of certainty. Of the remaining 160, 118 could be regarded with a fair degree of certainty or probability as "gliomatosis;" 6 were grouped as "fibromatosis" of the sheath; 29 as "endothelial tumours" of the sheath, and 7 as possibly "endothelial tumours" of the sheath.

Except for the substitution of the terms "glioma," "fibroma," and "meningioma," the above classification has been adopted by nearly all subsequent writers. Mathewson,[2] in a survey of the literature since 1912, found 61 additional cases, of which 52 were glioma, 9 meningioma, and 1 a fibroma. The great preponderance of gliomata is very definite. The subsequent remarks refer to the gliomata or "primary intraneural tumours."

Sex appears to play a small part; of 113 of Hudson's series where the sex was stated, 70 (62 per cent.) were females. The age of onset of symptoms is highly characteristic, the first symptoms being noted before 10 years in 62 per cent. and before 20 years in 88 per cent. of the cases of Hudson's series. In the majority of cases defect of vision

preceded exophthalmos and in most of the remainder where the case was first brought up because of proptosis, the sight was found to be already affected. As unilateral impairment or loss of vision without external signs is frequently not recognised by the patient for some time, and especially so in the case of children, it is clear that in the vast majority of cases defect of vision occurs before tumour formation becomes obvious through proptosis. In a number of cases there has been a history of antecedent injury to the skull or the eye. In the present case this history is definite, but it is clear that the blow by a snowball could have played no part beyond drawing attention to the blindness of the eye, as the disc was already pale when seen one week after the injury. Hudson considered that antecedent injury or disease was of some moment as a predisposing cause and gives a list ranging from injury to the skull to whooping cough; but if one recalls how constantly an injury is recollected whenever anything abnormal appears about a child's eyes or head, one can only conclude that the case is no more proved for such a predisposing cause than it is for glioma of the brain or for most neoplasms.

The proptosis is usually of slow progress and therefore not accompanied by pain. Its direction is usually straight forwards, a characteristic of growths within the muscle cone. When the tumour is large, however, some deviation from this direction is not unusual. Movement of the eyeball is commonly but little restricted or not at all so; this is mainly due to the fact that the growth does not transgress the limits of the nerve sheath and does not infiltrate the muscles and other tissues, and partly to the growth being usually in the posterior end of the nerve, the anterior end remaining sufficiently supple to allow the eyeball to turn.

As regards the ophthalmoscopic conditions found, in the great majority of cases the changes were those of post-neuritic atrophy. In the case here described, the disc still showed signs of papillitis although pallor was already definite when first seen. In some cases, however, primary optic atrophy has been noted. It seems that the appearance of the disc may depend largely on the position of the tumour: if near the eyeball, swelling of the disc with engorgement of the veins and later atrophy of the secondary type results from interference with the venous drainage; when the growth is far back primary optic atrophy would tend to result. Thus Martin and Cushing,[4] in a series of 7 cases where the growth appeared to originate in the chiasma and the optic nerve near it, found definitely primary atrophy in 5 of them.

In view of the marked tendency of the growth to spread centripetally along the nerve, it is rather surprising that descent towards the eye and into the nerve-head has only been recorded rarely. Two cases are reported by Verhoeff.[5] In the one case there was

found ophthalmoscopically, 3 years after the eye was found to be blind and 2 years after the onset of proptosis, a cystic mass protruding from the site of the disc. Microscopical examination showed that the optic disc was replaced by an overgrowth of neuroglia, which also involved the adjacent retina for 1-3 mm. The neuroglia at the summit of the disc had proliferated into the vitreous and this mass contained a cyst. In the other case gliomatous involvement of the disc was found microscopically. A third case is that of Martin and Cushing[4] of a chiasmal glioma where a swelling of the disc, considered as papilloedema, was found post-mortem to be due to extension of the gliomatous process to the disc. Weigelin[6] recently reported a case of glioma of the nerve in which a greyish yellow mass was seen on the disc. After exenteration this was found to be tumour tissue extending into the eyeball from the growth in the nerve. A fifth possible case is that of Sulzer and Rochon-Duvigneaud[7] where in a "neoplasm" of the optic nerve the disc was found to be replaced by a solid vascular growth. It does, however, appear from these that in cases of suspected glioma of the optic nerve particular attention should be paid to the character of any swelling of the disc.

Hypermetropia, due to pressure on the back of the globe, has been noted in several cases; in one, that of Collins and Marshall,[8] it was seen to increase during the period of observation.

In a few cases the growth in the orbit has attained sufficient size to distend its walls. In two of Hudson's series there was erosion of the bones at the base of the skull from intra-cranial extension, as in the case here reported.

The tendency of the growth is to extend along the optic nerve to the chiasma and brain, confining its spread to nervous tissue only. In no case has it been found to penetrate the dura and involve the other tissues of the orbit. It is therefore not surprising that local recurrence has never been recorded, though removal has in many cases been admittedly incomplete and in many more was probably incomplete. Many authors lay stress on this point and the tumour is regarded as of low malignancy. Musial[3] goes so far as to state that such tumours show "no characteristic of malignancy" because of the slow growth and absence of local recurrence, metastases, or involvement of lymph glands. A perusal of the published cases makes it quite impossible to accept this view of non-malignancy. In most of the cases which for any reason came to post-mortem, extensive intracranial involvement was found, and in others it was suspected at the time when the case was reported and the patient was still alive. Owing probably to the slow rate of growth of the intracranial extension, severe cerebral symptoms have often been long delayed and there can be no doubt that the number of cases where an optic nerve glioma ultimately killed the patient would have been

found to be much larger if the cases could have been kept under observation for a sufficiently long time. The case here recorded illustrates this, as for five years the cerebral symptoms were apparently not sufficiently severe to lead the mother to bring the child back to the hospital. A few cases have been reported where good health was present for many years, even as many as 24.

Within the last 15 years, largely as the result of the work of neuro-surgeons, gliomata of the brain have been divided into a large number of subdivisions according to the histological characters of the chief cells. Bailey and Cushing[9] have divided them into 12 groups, Penfield[10] into 8. In view of the origin of the optic nerve, there is no reason why most of the types found in the brain should not also occur in neuroglial tumours starting in the optic nerve, and it would be desirable to investigate these growths with this in view. Recent methods of glial staining, on which the sub-classification of gliomata has been largely based, require special methods of fixation of the specimen, as described in Cushing's book. In the present case this was not possible and the tumour cannot with confidence be classified further than as a glioma. It is of considerable interest that Cushing and others have found that the subdivision of the gliomata by their histological characters has not only an academic interest, but that the different groups have fairly distinctive characteristics of growth and corresponding prognosis. Thus, in the case of gliomata of the brain, patients with multiple spongioblastomas have a probable survival period of a few months only, and at the other end of the scale, those with astrocytomas (the commonest glioma) may expect a survival of 2—20 years. It is possible that it is a preponderance of the slower growing types of glioma which accounts for the relatively long survival after incomplete removal of optic nerve gliomata, and has led to these tumours being regarded as of low malignancy.

Most of the cases of glioma of the optic nerve have come primarily to the notice of the ophthalmic surgeon—on account of proptosis or loss of sight—and consequently most of the reported cases have been of intra-orbital, or mainly intra-orbital, tumours. Since the growth of intra-cranial surgery and especially the attention paid to lesions in the region of the pituitary fossa, it has of late years become increasingly evident that the intra-cranial portion of the nerve and the chiasma may also be involved, without or before any clinically recognisable tumefaction of the orbital part of the nerve. Martin and Cushing[4] reported 7 cases of primary gliomata which appeared to originate either in the chiasma or the optic nerves adjacent. In 5 of these a correct localising diagnosis of supra-sellar lesion had been made, but in only one was the probable character of the growth surmised before operation. Dandy[11] has also drawn attention to the fact that many intra-orbital optic nerve

tumours will be found to involve the intra-cranial structures, though the two cases he reports are both meningiomata and not gliomata.

As regards treatment, this has always consisted in removal of the tumour, frequently incomplete, with or without the globe. In the present case, owing to the position far back in the orbit, no attempt at removal was made but radium applied near and within the tumour on three occasions. Although the radium treatment did not succeed in arresting the growth, it is at least noteworthy that no tumour mass, except a small nodule no larger than the stump of an optic nerve, was found post-mortem in the orbit. Possibly the growth had already extended into and behind the optic canal, beyond the reach of radiation—the position of the tumour far back in the orbit suggests this.

Another point which stands out in this connection is the extreme slowness of the tissue ulceration resulting from radium. For at least a year after it was last used the lid margins were still intact, but the tissues were breaking down and ultimately the whole conjunctiva and the lid margins with their hair-follicles were destroyed, so that the final appearance was as if an exenteration of the orbit had been performed, and the epilatory effect even extended to the hairs of the eyebrow.

If, in removal of such a tumour, the globe is to be preserved the choice of access is between a Kroenlein operation or approach through either fornix; of the latter that through the outer fornix with temporary resection of the external rectus probably gives the best access. But preservation of the eyeball can only be of cosmetic value in these cases, and if a more serious view of the malignancy of these tumours is taken than formerly—and I think it must be when the frequency of intracranial extension is considered—then the retention of a sightless globe will be considered a small factor as compared with the better access after enucleation.

I wish to express my thanks to Mr. Melbourne Thomas for permission to publish the case, to Acting Professor Duguid, Department of Pathology, Welsh National School of Medicine, for granting me facilities for the microscopical examination of the specimen, and to Dr. Gough for his valuable assistance with this part of the work.

REFERENCES

1. **Hudson.**—*Roy. Lond. Ophthal. Hosp. Reps.*, Vol. XVIII, p. 317, 1912.
2. **Mathewson.**—*Amer. Jl. of Ophthal.*, Vol. XIII, p. 880, 1930.
3. **Musial.**—*Zeitschr. f. Augenheilk.*, Vol. LXXII, p. 189, 1930.
4. **Martin and Cushing.**—*Arch. of Ophthal.*, Vol. LII, p. 209, 1923.
5. **Verhoeff.**—*Arch. of Ophthal.*, Vol. LI, p. 120, 1922.
6. **Weigelin.**—*Klin. Monatsbl. f. Augenheilk.*, Vol. LXXXVII, p. 527, 1931.
7. **Sulzer and Rochon-Duvigneaud.**—*Ann. d'Ocul.*, Vol. CXLIX, p. 161, 1913.
8. **Collins and Marshall.**—*Trans. Ophthal. Soc. U.K.*, Vol. XX, p. 156, 1899.
9. **Bailey and Cushing.**—Classification of the Tumours of the Glioma Group. 1926.
10. **Penfield.**—*Brit. Med. Jl.*, Vol. I, p. 337, 1931.
11. **Dandy.**—*Amer. Jl. of Ophthal.*, Vol. V, p. 169, 1922.

PAPILLOMA OF THE LACRYMAL SAC

BY

R. BEATSON HIRD

BIRMINGHAM

OCULAR papillomata in any form are, in my experience, rare. In March, 1913, a patient consulted me on account of a chronic discharge from his left eye at the inner canthus. On examination I found a large, cauliflower-like growth with a fairly broad pedicle growing from the caruncle. It bled readily on touching it in the process of removing some muco-pus from its surface. There were a number of small nodules near the large one. The growth was removed under cocaine, as well as the small nodules, and the base cauterized. On microscopical section it proved to be a typical simple papilloma. This patient was seen again in June, 1915, when he came to have new glasses. There was no evidence of any recurrence. This is the only case of papilloma of the caruncle I have seen.

On November 13, 1929, I received a call to see an urgent case from a school near Birmingham. I was told a boy was bleeding badly from his left eye. When I saw him the conjunctival sac was full of blood and there was a swelling inside the left lower eyelid which was the source of the bleeding. This swelling I found to be a large pedunculated papilloma, springing from the palpebral conjunctiva and bleeding freely. The boy, who was aged 14 years, could not tell me how long the swelling had been present. There had been no bleeding before. The haemorrhage was really quite profuse. I removed the papilloma by cutting through at the base, taking a little of the conjunctiva around it. There was a fairly large vessel entering the stalk of the papilloma and I stopped the haemorrhage by putting in a small purse-string suture closing the hole in the conjunctiva. The boy had no further trouble and there has been no recurrence, as far as I know. On microscopic section this also proved to be a typical simple papilloma. This is the only case of a papilloma of the conjunctiva I have come across. I have found records of five cases of conjunctival papillomata in the *Trans. Ophthal. Soc. U.K.* since 1903.

Freytag in Vol. XC of *Arch. f. Ophthal.* (1915) reviewed the literature and refers to 31 cases made up as follows:—

Ocular conjunctiva	6
Limbus conjunctiva	11
Semilunar fold and caruncle	10
Conjunctiva of upper lid	3
Lacrymal sac	1

This latter is the only record of a papilloma of the lacrymal sac that I know of. In any case, it must be a rare condition and for that reason I put my case on record.

The patient was a woman, aged 39 years, who attended my out-patient department at the Birmingham and Midland Eye Hospital on August 19, 1929, complaining of a swelling at the site of the right lacrymal sac and blood in the eye since August 16. She stated that she used to get some bleeding as a child and had a tumour removed five times in childhood, the last time when aged 13 years, that was to say 26 years ago. This was done by Mr. Whitehead, of Leeds.

When I saw her, her vision was 6/6 in each eye and the eyes themselves normal. On pressure over the right lacrymal sac, which was distended, a blood stained discharge escaped through the punctum into the conjunctival sac and then, on further pressure, pure blood escaped. There were some old scars in the lower lid where I presumed the previous operations had taken place. I made the diagnosis of a papilloma of the right lacrymal sac and decided to remove the sac. This operation I did on August 22. I found the sac very distended and the wall very thin. I could palpate a firm nodular swelling in the sac. Before completing the dissection of the sac this thin wall tore and severe haemorrhage took place. The opening in the sac revealed a large papilloma. This was very friable and had to be removed in pieces. The haemorrhage was so severe that I destroyed the remains of the sac and stopped the haemorrhage by using the Paquelin cautery. The wound was then closed and healed up without any trouble. There has been no evidence whatever of any recurrence.

The pathological report was that it was a simple papilloma. The papillae were composed of cylindrical cells on a definite basement membrane with a vascular core of fibrous tissue.

I then wrote to Mr. Whitehead, at Leeds, asking him if he could trace any records of this case when under his care and he wrote me as follows:—(October 22, 1929)

"I removed a papillomatous growth from the right lower fornix excising the growth and stitching the conjunctiva together. The electric cautery was applied to some small papillomata on the conjunctival surface of both upper and lower lids. There is no note of any microscopic examination, but a note of a similar growth having been treated elsewhere 3½ years before." Mr. Whitehead very kindly gave me permission to publish this information.

RETINITIS PIGMENTOSA AND RETINITIS PUNCTATA ALBESCENS

BY

J. G. MILNER

LONDON

THE following cases seem to be worth reporting, as they show some interesting features.

Case I

Mrs. S., aged 22 years, came to see me in August, 1931, complaining of night-blindness. This she had had as long as she could remember, and she wanted to know if anything could be done.

Past History.—Apart from night-blindness there was nothing of note. She does not think that her complaint has progressed at all since she was a child.

Family History.—Her mother has been blind for eleven years. (For details of her condition see Case II.) Her father is dead, but as far as is known, his sight was good. She is the only child of this marriage. Her mother has married again, and has four children by her second husband. I have not yet had an opportunity of examining them. There was no blood relationship between her parents.

The patient is married, and there was one child, who died in infancy from broncho-pneumonia. So far as she knows, this child saw well.

Present Condition.—She is a healthy woman, with fair hair and a fair complexion. Vision in each eye is 6/18, and with hypermetropic correction, 6/6. The fundi present an appearance typical of retinitis punctata albescens. Small, discrete, whitish spots are scattered all over the fundus, the discs are normal in appearance, and the vessels not diminished in calibre. No lens or vitreous opacities are visible with the ophthalmoscope.

The visual fields are concentrically contracted, rather more of the lower half of the retina being involved in each eye.

Case II

Mrs. B., aged 41 years, mother of Case I. I saw her at St. Bartholomew's Hospital, in October, 1931.

Past History.—As long as she can remember, she has been night blind, and for the past ten or eleven years, has been more or less completely blind. Her sight failed gradually.

Family History.—Details of this are not very complete, but her mother went blind at about the age of 50 years, with a previous history of night-blindness. Her maternal grandfather was also night-blind. She has two brothers living, both of whom are affected, but I have been unable to get into touch with either.

Present Condition.—This woman has brown hair and a medium complexion. Her left eye is totally blind, the lens is opaque. There is faint perception of light in the right eye, with a very sluggish pupil reaction. In the fundus there is extensive retinitis pigmentosa, reaching from the periphery right up to the disc. The vessels are thin, and the disc itself has that colour typically described as waxy. There is a shallow retinal detachment below. There are vitreous opacities, and peripheral and post-cortical opacities in the lens.

Case III

Miss F. W., aged 17 years, was brought to St. Bartholomew's Hospital by her mother to see Dr. Carmichael on account of twitching movements of one side of her body. A diagnosis of hemichoreiform movements was made, and she was referred to the ophthalmic department for an opinion on some changes in the fundi.

Past History.—She is a deaf-mute, but is intelligent, and has done well at school. Her general health has been good.

Family History.—Her mother and father are alive and well. They are first cousins. I have examined them both, and their fundi are normal. There are two other children, a man aged 23 years, who has good vision, and is normal in every way, and a boy of 13 years, who is a deaf-mute. (See Case IV).

Present Condition.—This girl has light brown hair, and a medium complexion. She has myopic astigmatism, and with correction, vision appears to be about 6/18 in each eye. Both fundi show well marked retinitis pigmentosa, with narrowed arteries and waxy discs. There are vitreous opacities, but no lens opacities. I was unable to obtain an accurate visual field chart.

Case IV

C.W., aged 13 years, brother of Case III. I saw this boy at St. Bartholomew's Hospital also. He is a deaf-mute, is intelligent, and has always been healthy.

Present Condition.—He has very fair hair and a fair complexion. Vision, with glasses, is right, 6/12, left 6/12 partly. The fundi show, at the periphery, a few scattered "bone-corpuscle" shaped pigment spots. In addition, there is a large number of yellowish-white spots scattered all over the fundi. The discs are of a normal colour, and the vessels of normal size. There are a few vitreous

opacities in each eye, but no lens opacities. The visual fields are very restricted.

The Wassermann and Sigma reactions were examined in the blood of all four cases, and proved in each to be negative.

It is interesting to note the occurrence of retinitis punctata albescens in a woman whose mother is blind from retinitis pigmentosa. Nettleship[1] quotes cases of the two occurring in members of the same family, and others have been described. As one would expect, the disease in the daughter appears to be stationary, whereas in the mother it has progressed to blindness. It will be noticed that the onset of blindness in this particular case was rather earlier in life than usual, i.e., about 30 instead of 45 or 50 years of age.

In the other family it seems odd that the eldest child should be quite normal, while his brother and sister exhibit such hereditary taints as deaf-mutism and retinal degeneration. Furthermore, the fundus appearances of the two are different. The girl is an example of typical retinitis pigmentosa, the boy is not; although his visual fields are restricted up to the 10° circle, there is very little pigment, and what there is, is confined to the periphery. The discs are not waxy, nor are the vessels diminished in calibre; in the girl both these factors obtain. The small yellowish-white spots, scattered all over the fundi of the boy, are absent from those of his sister.

Nettleship has stated that retinitis punctata albescens is a variety of retinitis pigmentosa, and this is generally accepted. It follows that the pathology of the two conditions must be closely related. Opportunities of examining eyes with retinitis punctata, pathologically, seem to have been very few. I can find one case, quoted by Pascheff,[2] in which Wedl and Bock examined, histologically, such an eye. They concluded that the disease was due to oedema of the retina, and they found that there was evidence of inflammation of the external retinal layers. Gayet and Fuchs did not agree with this interpretation, and suggested that disappearance of the pigment in the region of the spots was responsible. The matter is not yet clear, nor are we yet agreed upon the pathology of retinitis pigmentosa. In considering my few cases, I was struck by the fact that Cases I and IV were lacking in pigment, as evinced by their very fair hair and complexion. One of these had retinitis punctata albescens, and the other, a change which seems to me to be intermediate between this and retinitis pigmentosa, being typical of neither. It seems possible, therefore, that a relative poverty or excess of pigment cells in the body, would manifest a similar poverty or excess in the retina, and given the necessary hereditary factor, whatever that may be, would be responsible for the type of fundus change in any given case. In this connection it may be mentioned that Healy[3] states that retinitis punctata albescens is

due to abnormal pigment deficiency. I cannot call to mind a case of retinitis pigmentosa in a very fair person, but I have seen too few examples of retinitis punctata to be sure of the opposite.

In conclusion, my thanks are due to Mr. Foster Moore for permission to report Cases II, III and IV.

REFERENCES

1. Nettleship.—*Roy. Lond. Ophthal. Hosp. Reports*, Vol. XVII, p. 390, 1907.
2. Pascheff.—*Ophthal. Rev.*, p. 65, 1905,
3. Healy.—*Brit. Jl. of Ophthal.*, p. 18, 1921.

TWINS WITH EYE DEFECTS—AMETROPIA AND STRABISMUS

BY

J. A. WILSON

CAMBUSLANG, GLASGOW

THE following twelve pairs of twins have been seen in the course of ordinary school and other eye-work. As they have been ophthalmologically selected they may not meet the strict requirements of the specialist in biometrics, yet their manifestations may be of some value.

The evidence of heredity found in uniovular, or monozygotic twins is naturally of great value. Information on the character of the pregnancy relative to this question is seldom available for the biometricians and for diagnosing mono- from dizygotic twins; they have to depend on height, weight, facial resemblance, colour of hair and eyes, head measurements and finger-prints.

The refraction of the eyeball estimated by retinoscopy, the curvature of the cornea taken by the ophthalmometer and the presence, or absence, of strabismus, in all pairs thought to be monozygotic should be made available for the biometricians. Sufficient information on these points would probably decide whether departures from emmetropia (hypermetropia, myopia and astigmatism) and strabismus, are due to heredity or to environment, to nature, or nurture.

It is impossible to say how many pairs in my series are monozygotic, yet all the pairs are of like sex and as in several pairs the retinoscopies are alike, it may be reasonable to assume that one-half are of monozygotic origin.

If we get, say, 4 dioptres of hypermetropia in one twin and 5 dioptres in the other, or 6 dioptres of myopia in one twin and 7 dioptres in the other, then probably these should be classed as being alike, but I have not done so.

It is claimed that dizygotic twins have the similarities and dissimilarities that are found in other members of the same families born at different times. As evidence on the conditions of brothers and sisters of twins is scanty, I have taken fifty pairs of brothers and sisters from other families and used them as contrasts.

The ametropia and strabismus found in twelve pairs of twins:—

		R.E.	L.E.
1. S. R., 10.	Strab. convergent, altern.	H. 5 D.	H. 5 D.
C. R.	Strab. convergent, altern.	H. 5 D.	H. 5 D.
2. G. S., 7.	Strab. convergent, R.E.	H. 5·5 D.	H. 5·5 D.
J. S.	Strab. convergent, L.E.	H. 5·5 D.	H. 5·5 D.
3. J. L., 7.	Strab. convergent, slight	H.A. 4 c. 1 D.	H A. 4 c. 1 D.
G. L.		H.A. 4 c. 1 D.	H.A. 4 c. 1 D.
4. C. C., 3.	Strab. convergent, L.E.	H. 2 D.	H. 2 D.
J. C	Strab. convergent, L.E.	H. 3 D.	H. 3 D.
5. T. F., 9.	Strab. convergent, L.E.	H.A. 2 c. 1 D.	H.A. 3 c. 1 D.
R. F.	Strab. convergent, R.E.	H.A. 2 c. 1 D.	H.A. 2 c. 1 D.
6. A. R., 7.		H.A. 2·5 D. cyl.	H.A. 2 c. 1·5 D.
W. R.		H.A. 1 c. 2 D.	H.A. 1 c. 2 D.
7. T. D., 9.		M.A. 1·25 D. cyl.	M.A. 1·5 D. cyl.
W. D.		M.A. 1 D. cyl.	M.A. 0·5 D. cyl.
8. M. L., 12.		H.A. 5 c. 1·5 D.	H.A. 5 c. 1·5 D.
J. L.		H.A. 3 c. 3 D.	H.A. 3 c. 3 D.
9. E. F., 12.		H. 8 D.	H. 8 D.
N. F.		H. 5 D.	H. 5 D.
10. B. C., 9.		H.A. 1·5 D.	H.A. 1·5 D.
E. C.	Strab. convergent, L.E.	H. 1·5 D.	H. 1·5 D.
11. M. G., 6½.		H. 3 D.	H. 1 D.
J. G.		H. 4·5 D.	H. 5·5 D.
12. Q. W., 6.		H.A. 1 c. 2 D.	H.A. 1 c. 2 D.
W. W.		H. 1 D.	M.A. 1·5 c. 2 D.

Pair No. 1 were seen when four years of age and again six years later when the conditions were found to be unchanged. Pairs Nos. 1, 2 and 3 may be considered to be alike; Nos. 4, 5, 6, and 7 have only 1 dioptre of difference; Nos. 8, 9, 10, 11, and 12 have more than 1 dioptre of difference between the members of each pair.

SUMMARY.

Cases alike	25 per cent.
Cases approximately alike	33·5 per cent.
Cases with more than 1 D. of difference .	41·5 per cent.

In the first group, five of the six children are squinters; in the second group, four of the eight children are squinters; and in the third, one of the ten children is a squinter. Although these figures are striking, the number of cases is not large enough to warrant any general deductions.

Brothers and sisters born at different times, and not related to twins:—50 pairs.

SUMMARY.

Cases alike or with only 0·5 D. of difference .	14 per cent.
Cases approximately alike	16 per cent.
Cases with more than 1 D. of difference . .	70 per cent.

In the first group here there are six squinters, in the second 4, and in the third 31 squinters.

I regret that my reports are imperfect from the biometrician's point of view.

It is highly desirable that others who have the opportunity should collect and report their observations on the state of refraction, the corneal curvature, the presence or absence of strabismus, the general resemblances and even other measurements. It is probable that such data would assist the valuable work being done by Dr. Percy Stocks and others, now in course of publication in the *Annals of Eugenics*.

A SUGGESTION AS TO THE CAUSE OF GLAUCOMA FOLLOWING THROMBOSIS OF THE RETINAL VEIN

BY

D. J. WOOD

CAPE TOWN

I THINK it is commonly agreed that where a patient's eyes are near the border line between normal and increased tension, the occurrence of thrombosis of the retinal vein may lead to a glaucomatous attack. The reasons for this do not seem quite satisfactory, and the following observations may be of use.

I have for a long time been in the habit of examining all the cases of fundus disease seen by me in private by red-free light, which, with a plane mirror, gives one an ideally fine picture of the finest details in the retina.

A 4·5 amp. Leitz arc lamp, a water cooler, a convex lens to render the rays only slightly divergent, and a Zeiss red-free glass filter is all the equipment needed, and costs about £5.

In old age the yellow tint of the patient's lens dims the brilliancy of the picture, and here one can substitute a Kodak Green "B" filter which will illuminate a fundus even where the lens is getting opaque. This has been used by others. It does not apply to the present cases.

In 1929 my attention was drawn to the fact that in the fundus of a young lady who had thrombosis with many haemorrhages, though one could see clearly with the ordinary electric light, the picture by red-free light was very dim. The vitreous, though clear, would not transmit the blue end of the spectrum.

Since then I have seen eight cases, and wherever the haemorrhages were extensive, the vitreous was found to be more or less opaque to red-free light.

Four patients were under 40 years of age. In two there were many haemorrhages, but glaucoma did not supervene, presumably because of youth. In two there were few haemorrhages, and neither was the vitreous stained, nor did glaucoma occur. Five cases were seen in older people. In two the haemorrhages were few, and the vitreous appeared similar to that in the other eye. Glaucoma did not occur.

In three there were many haemorrhages, with definite dimness of the fundus in red-free light. Two developed glaucoma, but died before pain demanded excision. In the third case I had to excise the eye. I was more interested in his retina than in his vitreous, and it did not occur to me to ask a bio-chemist to test the latter for haemoglobin derivatives, as might have been possible.

By red-free light one can see in some cases that not only are there haemorrhages in the retina, there are also haemorrhages on the retina which show up as dark glistening spheres.

The suggestion derived from these few cases is that some substance formed from haemoglobin is absorbed into the vitreous, and if in sufficient quantity alters its light transmitting properties, and may cause a turgescence of the vitreous gel.

Where there are a larger number of cases available for examination one hopes this suggestion may lead to further investigation.

KANDA'S CURVED SCREW ROLLER FORCEPS (A NEW MODEL OF MODIFICATION FROM KNAPP'S ROLLER FORCEPS)

BY

DR. KANJI KANDA

TAKAO, FORMOSA, JAPAN

"EXPRESSION of the granules with Knapp's Roller Forceps is" says Professor Komoto, "an international method of treatment of Trachoma." Indeed, Knapp's roller forceps, with its long history of existence since first devised by Dr. Knapp, is the most excellent instrument among those of the same design, so that it

is still used widely everywhere nearly all the world over with the highest admiration. But as for the mode of application, there may be a few different ways of handling the instrument among different ophthalmic practitioners, mostly according to the positions of the patients under operation.

In my country, also including Formosa, it is usual for the patient to lie down upon the bed for the operation with his face looking upward, and the operator stands behind him, looking over the head of the patient down at his face. This is the most common position of operator and the patient who is undergoing the operation for trachoma with Knapp's roller forceps. In this position, therefore, Knapp's roller forceps is deeply inserted into the everted conjunctival fornix (of upper lid) and pulled out not downward as it is usually shown in the text-books, but upward and forward because of the free margin of the everted conjunctiva being directed toward the ceiling of the operation room; so that the handling motion of the forceps must be done upward and downward in direction, with the straight legs of Knapp's forceps being grasped by the hand of operator quite vertically to the frontal plane of the face of the patient. This makes an inevitable obstacle to the sight of operator, because the straight legs or handles of Knapp's roller forceps, together with the grasping hand of operator stand at the line of sight of the latter and thus narrow the field of vision under operation. And this obstacle is quite common to every practitioner so far as he takes such a position as above mentioned.

The author, therefore, has devised a new model of reasonable modification from Knapp's roller forceps, in which the legs or handles of the forceps are bent in curves at right angles at about 1·5 cm. above the rollers. This new type of forceps is very convenient for use, especially when the operator stands behind the patient during operation. When this forceps is in use, the curved handles, being grasped horizontally in the manner of fiddle-stick grasping of surgical knives, are parallel to the frontal plane of the face of the patient. And so the grasping hand of the surgeon is quite aside the line of sight of operator, so that it does not obstruct the sight of the latter, but leaves an ample space of sight for the operation.

On the other hand, the author has made screw rollers and attached them to the curved handles of his design, in which the winding of the screws is in opposite direction in each roller. Therefore, the rolling of these screw rollers is much easier than in those of Knapp's roller forceps. As, in Knapp's roller forceps, the rollers are, as everyone knows, grooved horizontally along the long axis of them and perpendicular to the direction of pulling the handles, so that they are not uncommon to be pulled out

without rolling, owing to the large mass of granules or of the hypertrophied conjunctiva that is squeezed between them, which damages the conjunctiva unnecessarily. While in the author's forceps, because of the lightness of the rolling motion of the screw rollers with simultaneous completeness of expression of the

FIG. 1.

Kanda's Curved Screw Roller Forceps.

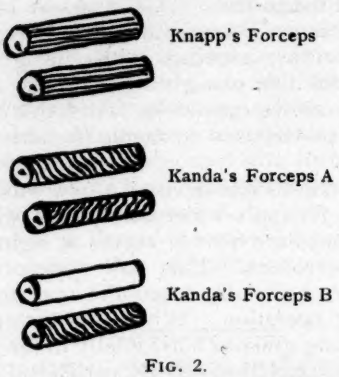


FIG. 2.

The Rollers of Knapp's and Kanda's Forceps.

granules, the proper ability of roller forceps is fully utilized. The author used himself his newly devised forceps with highly successful results. And he calls them "Kanda's Curved Screw Roller Forceps," type A. For he has also devised type B. But in this form only one of the two rollers has screw grooves, and the other one has no grooves, but is only a smooth cylindrical roller of the same size. This latter type of forceps is very useful for the same purpose as the former one, especially for those who have many granules in the conjunctival fornix, and relatively little or no granules in the palpebral conjunctiva. In these cases,

the B type of forceps, with its smooth roller applied to the intact side of the conjunctiva, is used with much success in expressing the granules of the fornix without harming the palpebral conjunctiva. The author, therefore, wishes every practitioner may have these two of the forceps and take any one of them for the use of operation according to the condition of granules.

As for the author, his own way of expression of trachoma with his newly devised curved screw roller forceps is always accompanied by Kaining's massage and polishing of the conjunctiva with the glass rod. This method brings about many successful results. The curved screw roller forceps of Kanda is manufactured as well as sold by Handaya Medical Instruments Manufacturing Co., Tokio. It has been very successful in his hands and so the author believes no one can be disappointed by the use of this new type of curved screw roller forceps. (October 9, 1931.)

A SEVENTEENTH CENTURY LETTER DEALING WITH OPHTHALMIC MATTERS, ETC.

BY

R. R. JAMES

LONDON

A TRANSCRIPT of the letter here published was sent to me recently. It seems of sufficient interest to be printed in this journal.

Add. MS. 29244, *fo.* 10.

"Good Mr. Powers,

Because this affect proceedes from accidentall distemper rather than any naturall affluxion of humour, it had bene good to have opened a veyne, but nether y^r yeares nor y^s time of y^e yeare are propitious, therefore if you find any disordered heates, I advise you to y^e use of barly water made with liquerice anise seedes etc. I have directed you four thinges none not physicall as (y^t word is comonly taken) but only to rectify y^r serous humour & voyd it by urine w^{ch} is y^e intention of y^e pills to be taken at nights. I love no much tampering with thinges blowne into y^e eye ***but now white sugar candy used as you mention can do no hurt.*** Therefore you may be bold wth it. I heare y^{or} Dr there is much offended w^t me for ... ying a^{gt} him. I pray stop y^e rumor I assure you I have bene ever silent in y^e censure of wandering practitionours & so of him, but for a few words I inserted into a

lettre to you, I suffre such to weary out themselves. I think him worthy of contempt not of opposition wch would make the world thinke there were something good in him yt might disadvantage me. Let him therefore not think of me, as I doe not of him, being neither sorry for his stay, nor glad for removall. This in haste wth my fond love to you I rest,

yor very loving friend
John Symcottes.

Remember my service to Mrs Willis. Dec: 20. 1636.

Bathe yor eyelidd, wth the water in the glasse oftentymes in the day, at yr pleasure and now and then you may dropp a dropp or 2 into yr eye especially to bedward and every night to bedward swallow doune 2 of the pills in the boxe, and soe rest.

And every morning fasting, and also about halfe an houre after meales, eate soe much of the powder in the paper as you can take up wth a shillinge.

Alsoe use yor wte ointment yet somtymes, as before."

The writer of this letter was admitted, as John Symcotes, pensioner, at Queens' College, Cambridge, April, 1608. He was the son of John Simcotes, of Sutton, Beds. He matriculated in 1610 and took his B.A. in 1611/12; M.A., in 1615 and his M.D., from King's College, in 1636. His brother, who was also at Cambridge, became a parson and was Rector of a parish in Bedfordshire. The annotation notes are from Venn's *Alumni Cantabrigienses*, Vol. IV. I have not been able to find out when Dr. Simcotes died. Perhaps I ought to add that I have preserved the original orthography save in the word *lettre*, which I have extended from the formal contraction of the time.

ANNOTATION

Instruction in the Treatment of Ophthalmia Neonatorum

At the annual meeting of the British Medical Association held at Eastbourne in July, 1931, a resolution was carried drawing the attention of the General Medical Council to the present unsatisfactory state of the curriculum with regard to the teaching of the treatment of ophthalmia neonatorum to medical students.

It seems a pity that the facilities which exist at St. Margaret's Hospital should not be utilized for medical students in the same manner as they are for pupil midwives; but it is a well-known fact

that very few medical students have availed themselves of the opportunity in the past; and until a short course is made compulsory there does not appear to be much hope of improvement in this matter.

It seems to us that it would be perfectly practicable to insist on each medical student attending a course of five or six demonstrations before being signed up. Such a course could be held thrice yearly. It would not increase unduly the burden of the present curriculum.

The following communication (May 27, 1932) from the Registrar of the General Medical Council has been received:—

> "With reference to your letter of April 22 with regard to ophthalmia neonatorum, I have to say that this was considered by the Education Committee of the Council at their meeting on May 24, when it was resolved:—
>
> > That the British Medical Association be informed that it was intended that the care and treatment of ophthalmia neonatorum should be included under 'Diseases of the Eye' in the resolutions of the Council in regard to Professional Education, and it was not considered expedient to refer to specific diseases by name or to define how and where opportunities for studying them should be obtained."

It will be remembered by the older members of the ophthalmic fraternity that a deputation consisting of Mr. Jonathan Hutchinson, Sir William Bowman, Mr. Tweedy, Dr. McKeown, Dr. Brailey and Dr. Abercrombie waited upon the Local Government Board on May 15, 1885, with the object of impressing upon the authorities the importance of ophthalmia neonatorum as the chief cause of preventable blindness in children. At that time the suggestions of the deputation were held to be impossible of fulfilment, on account of the additional work which would be thrown thereby upon the Registrars of births, whose duties were laid down by Act of Parliament, and whose remuneration was also settled by Act of Parliament. Extra work without extra pay was anathema to the official mind 47 years ago.

Now that ophthalmia neonatorum is a notifiable disease, the objections raised by the then Local Government Board no longer obtain, and the necessity for every medical man to have an adequate knowledge of ophthalmia neonatorum is so obvious that we hope the last word has not been said on this matter.

COUNCIL OF BRITISH OPHTHALMOLOGISTS

Annual Report

THE Council presents its report for the year 1931-32. At the first meeting the following were elected as officers:—*President*, Mr. J. Herbert Fisher; *Vice-Presidents*, Sir J. Herbert Parsons, Mr. Bernard Cridland; *Hon. Treasurer*, Mr. M. S. Mayou; *Hon. Secretary*, Mr. R. Affleck Greeves. The following were appointed to serve on the Executive Committee: The President and Secretary, *(ex officiis)* with Mr. Mayou, Mr. Juler, Mr. Levy, Mr. Williamson-Noble and Mr. Neame.

During the past year the chief item in the work of the Council of British Ophthalmologists, has been the preparation and issue of a report on the Certification of Blind Persons. It was a particular pleasure to be able to announce this in Edinburgh, in view of the fact that the Scottish ophthalmic surgeons have been, and still are, pioneers in this matter. The Committee which prepared our report received the most willing and valuable assistance from Dr. Ballantyne and Dr. Marshall, and it is on the system already doing such valuable work in Scotland that the recommendations are based. The report has been published in the *Brit. Jl. of Ophthal.* and received favourable consideration in all quarters. As the result of its transmission to the Ministry of Health, the President of the Council of British Ophthalmologists was co-opted on the Prevention of Blindness Committee of the Union of Counties Associations of the Blind, while it has formed the text upon which has been based a very exhaustive report by that Committee. It is to be hoped that in due time if the system for Examination and Certification of the Blind of the United Kingdom which has been adopted is put into operation, a reliable and scientific classification of the whole Blind Population will result in the solution of many anomalies and difficulties which exist, and indicate the steps which are necessary for the efficient treatment of eye disease and injury, and thus for the diminution of blindness.

Within the last few weeks a Sub-Committee has reported to the Council on Compensation for Eye Injuries. This report has been considered and after amendment received the approval of the Council: it will shortly be published in the *Brit. Jl. of Ophthal.*

The Council desires to thank the Council of the Royal Society of Medicine for the use of rooms for meetings.

As in former years, the expenses of the Council have been defrayed by contributions from its members.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.
ANNUAL CONGRESS, 1932, AT EDINBURGH

THE Annual Congress of the Ophthalmological Society of the United Kingdom was held in the Department of Physiology of the University of Edinburgh, on Thursday, Friday, and Saturday, May 12, 13, and 14, 1932.

The proceedings opened in customary fashion with the Presidential Address; Dr. A. H. H. SINCLAIR chose for his subject the Intracapsular Extraction of Cataract. He dealt in detail with the pre-operative and post-operative management of these cases, and described each step of the operation. Amongst many interesting points raised by the President was the advisability of making the incision immediately after the retro-ocular injection of novocaine and adrenalin (which he always uses) on account of the tendency of the latter manoeuvre to lower the tension of the globe. He produced charts of the results of the operation, which showed that in his hands it gives a high percentage of good visual results. Dr. Sinclair employs the method in all cases of cataract extraction, and instanced as an advantage of the method, its obvious suitability in the treatment of immature senile cataract.

The Address was received with great interest; a vote of thanks to the President was proposed by Mr. Treacher Collins, and seconded by Dr. Maitland Ramsay, to which Dr. Sinclair briefly responded.

DR. J. URBANEK, of Vienna, then read a paper on Ocular Tuberculosis. He concentrated on the specific diagnosis of tuberculosis, and gave details of the use of Toeniessen's tebeprotin, according to the method of Mantoux, which is exclusively used in his clinic, both for diagnosis and treatment. A short discussion followed.

MR. DAVID LEES made some observations on the use of tryparsamide in the treatment of optic atrophy due to syphilis. From his experience he concludes that the use of this drug is a definite advance in therapy, that it does arrest the process of atrophy, and that the reports of the tendency to produce amblyopia by its use are grossly exaggerated. In the course of the discussion, Mr. Paton made the relevant observation that optic atrophy may remain *in statu quo* for years where no treatment is being undertaken.

MR. MAURICE WHITING reported a case of Syphilitic Tarsitis. He described three types of syphilitic affection of the lid, and showed how the administration of N.A.B. to his case, in whom the Wassermann reaction was negative, brought about a rapid cure. Mr. Hine, Mr. Fisher, Dr. George Mackay, and Mr. Paton described similar cases.

DR. TRAQUAIR described the operation and end-results of External Dacryo-cysto-rhinostomy by a modified Toti's method. His figure of 71 per cent. of non-watering eyes after operation compares well with that of 44 per cent. after simple excision of the sac. Dr. Traquair answered many questions arising out of his paper.

The afternoon session commenced with MR. MAYOU'S description of congenital absence of the corneae in a foal, and his report on a case of blood staining of the eye, both of which papers were illustrated by epidiascopic projections of microphotographs.

MR. C. EDMUND followed with a description of his investigations into the problems of Nyctalopia and Hemeralopia; he suggested the use of the term *Dysaptatio visualis* in this connection, and showed curves indicating the differing powers of distinction of his cases.

DR. CLARK SOUTER read an interesting paper on Papillomatosis Conjunctivae, which provoked a lively discussion. He demonstrated the tendency of these growths to appear in the exposed fissural area, and postulated as their origin an inflammatory reaction to the presence of a filtrable virus.

MR. CHARLES GOULDEN described two cases of Epibulbar Carcinoma, of which Mr. Whiting demonstrated the pathological side in the absence of Mr. Stallard. Mr. Collins pointed out how these growths in their behaviour supported the lymphatic permeation theory of Sampson Handley.

Bowman Lecture

The Bowman Lecture, on Ocular Movements, was delivered by PROFESSOR DR. J. VAN DER HOEVE. After thanking the Society for the invitation to deliver the Lecture, the Professor touched on a few incidents in Bowman's life which illustrated the latter's friendship with the leading Dutch ophthalmologists of his time.

Professor van der Hoeve then gave an extremely able survey of past experimental work on ocular movements, with details of his own work, and that of other present-day investigators; his lecture was fully illustrated with photographs and diagrams. The conclusion he has reached is that the conception of a fixed centre of rotation for the eye is quite erroneous; the eye goes about a movement in the easiest and simplest way for itself, and even separate fibres of the same muscle have different actions, so that another accepted idea—that a muscle acts from the centre of its origin to the centre of its insertion—must also be discarded. The lecturer's characteristic style was, as usual, a delight to his audience; he concluded with an amusing reference to the basic ideas underlying the employment of periscopic lenses.

A vote of thanks was proposed by Mr. Treacher Collins, and seconded by Dr. George Mackay, who commented on the happiness

of the choice of lecturer on account of the long association of Holland and Scotland.

The second day's session commenced with a discussion upon Senile Cataract: the Pre-operative and Post-operative Management and Complications, which was opened by DR. A. J. BALLANTYNE. He dealt with the varieties of technique in preparation for operation, especially in connection with the cleansing of the conjunctival sac, and reviewed the group of cases needing special pre-operative care. As to complications, while purulent infections were far fewer than formerly, the incidence of iritis on the 4th or 5th day was still much too high. The opener raised the question of the possibility of post-operative astigmatism being caused by pressure from the dressing.

SIR ARNOLD LAWSON followed with a careful survey of some pre-operative points, and dealt in some detail with post-operative iridocyclitis, recommending full mydriasis as a preventative measure. He then discussed the question of capsular opacities and the technique of capsulotomy.

SIR RICHARD CRUISE raised the important point of gaining the patient's confidence, and said that he made his patient undertake to be his "intelligent assistant."

DR. TRAQUAIR discussed the incidence of mental derangement and death in cataract patients. Mr. Foster Moore, Lt.-Col. Lister, Mr. Whiting, and Mr. Greeves contributed remarks on the question of vitreous loss and iris prolapse; Lt.-Col. Wright and Mr. Holland spoke on post-operative iritis. Professor van der Hoeve, Mr. Hepburn, Mr. Inglis Pollock, Mr. Dorrell, Mr. Doyne, Mr. Neame and others also took part, and Dr. Ballantyne and Sir Arnold Lawson briefly spoke in conclusion.

The discussion was followed by a paper by MR. G. F. ALEXANDER on the Lip-Graft Operation in Trichiasis.

The afternoon was occupied by a Clinical Meeting in the Eye Department of the Royal Infirmary, at which were shown, amongst many other cases, series of cases showing the after-results of Intra-capsular Extraction, External Dacryo-cysto-rhinostomy, and Cyclodialysis. All the cases, after being examined, were described and discussed.

At the evening session, DR. ERNEST THOMSON gave a detailed account of the organisation and administration of School Ophthalmic Clinics in the County of Lanark. He provided specimens of most of the papers and forms used in this work, and illustrated their use. The account was followed by an interesting discussion.

MR. JOHN MARSHALL and DR. C. W. GRAHAM followed with a paper upon Blindness and its Certification, the former dealing with the administrative side, and the latter with the clinical. The methods evolved in Scotland, and their application, were described in detail, and tables of results were shown. In the course of the

discussion which followed, Mr. Fisher congratulated the Scottish on their advance in this matter; Dr. Ballantyne, Dr. Clark Souter, and Mr. Leslie Paton also spoke.

The last morning of the Congress began with a paper by Mr. C. D. SHAPLAND on Retinal Detachment and Gonin's operation. He reviewed the second 100 cases operated on by this method at Moorfields, and gave tables of results, which showed a rather lower percentage of cure in this series than in the first 100. He also described seven cases of bilateral symmetrical detachment of the retina.

MR. WOLFF described a case of recurrent proptosis, which proved to be one of Cavernous Lymphangioma of the Orbit undergoing successive attacks of inflammation. Similar cases were described in the discussion which followed; interest centred in the appropriate treatment of these cases.

MR. TUDOR THOMAS gave a detailed account of five experiments lately performed by him, in the Transplantation of Scleral Tissue on to rabbit's cornea, as a result of which a definite tendency towards subsequent transparency in the scleral graft was disclosed—a remarkable fact. The paper was received with much interest.

MR. INGLIS POLLOCK gave a report on two cases of Cerebro-Retinal Familial Degeneration, which he reported as two cases of Leber's Disease at a previous Congress. He gave a résumé of his previous report, and entered into the question of the early signs in this disease. Mr. Leslie Paton raised the question of the existence of a third form of this disease in addition to the two commonly described; Mr. Collins pressed for their recognition as two very different diseases on pathological grounds.

MR. NORMAN DOTT then read two papers. The first, on Two Cases of Meningioma of the Tuberculum Sellae, illustrated the value of Perimetry in such cases, a point stressed later by Dr. Traquair. The speaker gave details of operative technique by the transfrontal route, and the discussion turned mainly on the nerve lesions and field defects found in these cases.

The second described the successful undertaking of Intracranial Resection of the Optic Nerve in a case of Glioma Retinae, where after enucleation it was found that the section through the nerve had passed through tumour cells. Dr. Spence Meighan, to whom the case belonged, advocated this procedure in some cases even when the section was found to have passed through healthy nerve.

At the conclusion of the Congress the Annual Meeting of the Society was held. After business, which included the election of Officers for the ensuing year, was completed, Mr. Fisher proposed a

vote of thanks to Professor Sharpey-Schafer and the University authorities for their courtesy in allowing the Society to meet in the Department of Physiology, and to the President and Officers of the Society for their organisation and conduct of the Meeting, both of which proposals were carried with acclamation. Mr. Paton proposed a vote of the thanks of the Society to Miss Mann and the local members for their organisation of the exhibits in the Museum.

This meeting was followed by that of the Council of British Ophthalmologists, at which the Annual Report was presented, and business conducted.

A Scientific Museum was arranged in connection with the Congress, containing a number of interesting exhibits, which were grouped under the following headings: Pathology; Congenital Anomalies; Comparative Anatomy; Anatomy and Physiology; and Instruments.

A Trade Exhibition was also held, at which the following firms were represented: Messrs. Clifford Brown, Curry and Paxton Down Bros., Hamblin, Taylor, and Weiss.

Annual Dinner

The Annual Dinner of the Society was held on Thursday, May 12, in the Royal College of Surgeons' Hall, Edinburgh; the President in the Chair. After The King had been toasted, the President, proposing the Society, remarked on the fact that this was the centenary year of Surgeons' Hall, and gave a review of the medical life of Edinburgh from early times. Mr. Paton, in an entertaining speech, embellished by many apposite Scots stories, gave the toast of the Bowman Lecturer, emphasising his delightful characteristic of friendliness; Professor van der Hoeve replied in happily chosen terms, and referred to the continuance of the long-standing relations between Dutch and British ophthalmologists. Dr. Traquair, in a witty speech, proposed the Guests, mentioning the more prominent by name; Mr. Dowden, the President of the Royal College of Surgeons of Edinburgh, responded. Finally, Mr. Juler proposed the health of the President, which was drunk with musical honours.

The company was entertained by Dr. Simpson, who sang to the accompaniment of Professor Tovey.

FRANK W. LAW.

ABSTRACTS

I.—NEUROLOGY

(1) **Landegger, G. (Vienna).—Early development of syphilitic optic atrophy. (Ein beitrag zur Kenntniss der frühauftretenden luetischen Sehnervenatrophie).** *Zeitschr. f. Augenheilk.* Vol. LXXIV, p. 29, 1931.

(1) **Landegger** reports the case of a man, aged 30 years, who, three months after developing a chancre, complained of headaches and vomiting. Fourteen days later he became unconscious; the pulse was slow (60), the temperature subnormal, and there was right-sided ptosis. He recovered from what was diagnosed as syphilitic meningitis, but was left with bilateral optic atrophy five and a half months after the primary infection. The literature on early optic atrophy in syphilis is reviewed.

ARNOLD SORSBY.

(2) **Cucchia (Perugia).—Alterations of the acuity of indirect vision in diseases of the optic nerve. (Ricerche sul Comportamento dell'acutezza Visiva indiretta nelle Affezioni del Nervo Ottico).** *Ann. di Ottal.*, February, 1931.

(2) **Cucchia** has, in this series of examinations, availed himself of the method proposed by Lo Cascio; for this he uses a perimeter with a radius of 1 metre; the acuity at any angular distance from the centre, is tested by means of Contino's variable test-object. The size of this can be varied from one corresponding to Sn. 5 to Sn. 50. This is an interesting paper on a form of perimetry and a means of judging the condition of the peripheral retina, which has not received much attention in the past.

HAROLD GRIMSDALE.

(3) **Bellavia (Palermo).—Sensory-motor ophthalmoplegia. (Sulla Sindrome della fessura Sfenoidale).** *Boll. d'Ocul.*, April, 1931.

(3) **Bellavia** reports three cases of this condition in all of which paralysis of the sixth nerve persisted after the remainder of the symptoms had disappeared. He concludes that the primary seat of the lesion is in the outer wall of the cavernous sinus.

HAROLD GRIMSDALE.

(4) **Vancea, P. (Cluj).—Is there an iris-syndrome in tabes and general paralysis of the insane? (Existiert ein Symptomenkomplex der Iris bei Tabes und Paralysis progressiva?)** *Zeitschr. f. Augenheilk.*, Vol. LXXIII, p. 254, 1931.

(4) Tieri and other observers speak of an iris-syndrome in syphilitic lesions of the central nervous system consisting of atrophy of the iris, irregular pupils and anisocoria. The relationship of these to the loss of light reflex is unknown ; Dupuy-Dutemps holds that the characteristic iris atrophy, consisting clinically of obliteration of structural details in sectors of the iris, is the trophic expression of a more centrally situated lesion. **Vancea** in a series of 28 cases of tabes and general paralysis found atrophy of the iris in 8 cases, irregular pupils in 4, and anisocoria in 13 cases. In no case was the complete triad present, though 2 cases showed a combination of iris atrophy with anisocoria and one case iris atrophy with irregular pupils. As the loss of light reflex was present in all cases, the Argyll Robertson pupil cannot be the result of these peripheral changes, which themselves appear as isolated phenomena and cannot be spoken of as a syndrome.

ARNOLD SORSBY.

(5) **Walker, Clifford B. (California).—Retrobulbar neuritis and multiple sclerosis.** *California and Western Medicine*, January, 1931.

(5) **Walker** makes the purpose of his paper the emphasis to be placed on very careful quantitative perimetry in the differential diagnosis of the causes of retrobulbar neuritis. After describing anatomical data in regard to weak spots in the bony walls of the sphenoidal and ethmoidal sinuses and the covering of important structures, he turns to a brief review of disseminated sclerosis suggesting from the figures given that an average would show 50 per cent. of optic atrophy in disseminated sclerosis and 50 per cent. disseminated sclerosis in retrobulbar neuritis. He gives the clinical history and perimetric records of four typical cases.

Before suggesting an intranasal operation each case must be watched carefully, for the earliest signs of field recovery will put the case among those which will improve, with, in spite of, or without, an operation. Impressed by recent work on virus infection he uses heavy dosage of salicylates while watching the case even though it may have only a moral effect.

As a general observation he considers that as time goes on more cases of retrobulbar neuritis will be transferred to the disseminated sclerosis group and that a guarded prognosis must be given in view of the possible later declaration of a frank disseminated sclerosis in many cases.

R. C. DAVENPORT.

II.—THERAPEUTICS

(1) **Birch-Hirschfeld (Königsberg).—A comparison of results of cataract operations with and without prepared conjunctival flap. (Ein Verleich der Resultate der Altersstaroperation mit und ohne vorbereitetem Bindehautlappen).** *Zeitschr. f. Augenheilk.*, Vol. LXXIV, p. 1, 1931.

(1) **Birch-Hirschfeld** analyses the results obtained from 777 extractions in the usual manner and from 543 extractions after a preliminary preparation of a conjunctival flap, dissected up from the limbus and pulled over the corneal incision at the end of the operation. The statistics show much better results in the case of the second method, in almost every direction, from ultimate functional result to the incidence of complications. The author strongly advocates this modified procedure.

ARNOLD SORSBY.

(2) **Papagno.—Stomosine therapy in gonococcal infection. (La Stomosinoterapia Specifica nella Congiuntivite ed Uretrite Gonococcica.** *Lett. Oftal.*, April, 1931.

(2) Centanni propounded a theory that the phenomena of all infective diseases are due to endotoxins liberated from dead bacteria and to other toxic materials produced by the tissues attacked by these endotoxins. The organism possesses ferments in an inactive state, capable of oxidising and destroying these toxins; such ferments are made active by substances liberated from the dead bacteria by a process of autolysis. To such substance he gave the name "stomosines." Generally the amount of the stomosine contained in the organism is small, and to combat an infective process it is necessary to introduce a sufficient quantity. Centanni claims to have isolated this substance, which can therefore be used with action more rapid than that of vaccines. **Papagno** has used the antigonococcic stomosine with great success in a number of cases.

HAROLD GRIMSDALE.

(3) **Chambers, E. R. (Bristol).—Treatment of ocular diseases with Mercurochrome.** *Brit. Med. Jl.*, December 13, 1930.

(3) In the hands of **Chambers** and others in Bristol mercurochrome has proved of considerable value in ophthalmology. Chiefly in the treatment of conjunctivitis—to a less extent in corneal ulceration and blepharitis—it will replace silver preparations giving as good results with less local irritation and no staining of the conjunctiva on prolonged usage. He uses drops, ointment or paint in 1 or 2 per cent. strength in treatment and as a 1 per cent.

solution for an antiseptic in ophthalmic surgery. The risk of staining the skin red if left in contact and a personal idiosyncrasy seen twice in four years are the only drawbacks he has found. For four years mercurochrome has been used in the maternity work of the Infirmary replacing silver nitrate as the instillation for the eyes of new-born babies.

Ophthalmia neonatorum has decreased and the many red eyes caused by silver nitrate are now not seen. Only in the known presence of gonorrhœa is silver used.

R. C. DAVENPORT.

(4) **Royle, N. D.—The treatment of blindness associated with retinitis pigmentosa. A preliminary note.** *The Med. Jl. of Australia*, September 13, 1930.

(4) In this preliminary note **Royle** brings evidence of some success in improving the vision in retinitis pigmentosa by division of the thoracic sympathetic trunk about the level of the second thoracic ganglion. For only one out of five cases thus treated are notes given, but in this case visual acuity improved in two months from perception of moving objects within four feet to 6/60 and 6/36, while the field of vision was said to have increased by 10 per cent. four months after operation. The other cases were reported to show improvement but the note was written too soon after operation to make any accurate statement of results.

R. C. DAVENPORT.

III.—MISCELLANEOUS

(1) **Mirimanoff, A. (Geneva).—Cranio-facial dystrophies and ocular disturbances. (Dystrophies cranio-faciales et troubles oculaires).** *Rev. gén. d'Ophtal.*, October-November, 1930.

(1) This article by **Mirimanoff** is a review, and is so called by the author. It contains only some eight pages with about four pages of bibliography containing nearly one hundred full-titled references, which date from 1924 to 1930. This review is by no means a mere catalogue. On the contrary, it is a most interesting exposition of the principal features of what in general may be called tower-skull and associated conditions. Since the task of synopsising a synopsis is one which merely represents wasted effort a few of the most informative paragraphs will be given. As the author's very last paragraph is one of these it may be placed first.

"To sum up, there is a group of cranio-facial osseous dystrophies either congenital or acquired during the first months of life which

may affect the ocular apparatus in various ways. Without attempting to isolate exactly the types met with it is possible to make a schematic classification. On the one hand there is a syndrome of premature cranio-synostosis, comprising extreme forms such as acro-cephalo-syndactyly (or true oxycephaly), cranio-facial dysostosis and all the degrees of false oxycephaly; scaphylocephaly, trigonocephaly, etc. On the other hand, there are the essential hypertelorism of Greig and the cases described under the title of hypertelorism but where the abnormal separation of the eyes appears to be merely an accessory symptom. In that case there is no premature cranio-synostosis and as a rule no optic atrophy but there is obliquity of the palpebral fissures with strabismus." The next interesting paragraph for translation concerns hypertelorism. "Hypertelorism concerns ophthalmology on account of the characteristic symptom which gives a name to the condition. Ocular hypertelorism means in fact very great separation of the globes, an exaggerated inter-ocular distance. Greig (of Edinburgh) who gave the first complete description with autopsy sets it down to a congenital cranio-facial malformation."

Those who are interested in such conditions as these should certainly consult this review. They will find not only the references to literature but a clear description in brief of the different conditions to which the author refers. One should joke "with difficulty" or at any rate with considerable discretion when dealing with serious diseases, yet the reviewer cannot refrain from mentioning a case quoted by Mirimanoff in which a young man of 19 years, apparently suffering from cranio-facial dysostosis, was able voluntarily to protrude his eyes, separately or simultaneously and then to pull them back again by muscular action alone. The drawings of Bateman have a foundation in fact. Nor does it require much imagination to realize what a salary could be commanded by a music-hall artist or a pantomime star who could add to his facial contortions the ability to push his eyes out on stalks one at a time or both together.

ERNEST THOMSON.

(2) **Cosmettatos, G. (Athens).—Some diagnostic difficulties in connection with ocular tuberculosis. (Sur quelques difficultés diagnostiques de la tuberculose oculaire).** *Rev. gén. d'Ophtal.*, February, 1930.

(2) The main portion of the article by **Cosmettatos** consists in personal reminiscences of cases in which there have been diagnostic difficulties of various kinds. In some of these cases the disease was supposed to be tubercle and was not, while in others a condition thought to be typical of syphilis, or of trachoma, turned out to be tuberculous. In one particular case what appeared to be a typical

tuberculosis of the conjunctiva turned out to be an infective conjunctivitis and was cured by purely local treatment. The last two pages of this article are taken up with the description of a histological examination of a tuberculous eye.

ERNEST THOMSON.

(3) **Gourfein-Welt, Madame L. (Geneva).—A case of leuco-sarcoma of the choroid. Difficulty in diagnosis. (Un cas de leucosarcome de la choroïde. Les difficultés de son diagnostic).** *Rev. gén. d'Ophtal.*, September, 1929.

(3) Put in a nutshell the difficulty encountered by **Madame Gourfein-Welt** in this case was to decide upon the nature and the consequent treatment of a pathological and suspicious fundus appearance in a relatively good eye (*quâ* vision) when the fellow eye was rapidly deteriorating from a totally different affection. Add to this that the patient was 72 years of age, an "intellectual," and that he had recently had influenza, which might account for the appearances in the fundus, it is easy to appreciate the difficulties. A sudden outbreak of glaucoma in the eye suspected of the tumour, which followed an eighteen months period of "no change" in the appearances, settled the matter; but enucleation was followed by sarcoma of the liver and in a few months the patient was dead. The authoress describes the pathological examination of the enucleated eye and enters into a short disquisition of the difficulties of such cases.

ERNEST THOMSON.

BOOK NOTICES

The Anatomy of the Human Orbit, and Accessory Organs of Vision. By S. ERNEST WHITNALL. Second edition, 1932. Oxford University Press. Price, 25s.

In the days of John Hunter a training in anatomy was regarded as the primary essential for the practice of surgery: in the last 50 years the pendulum has swung probably too far in the opposite direction. The reviewer recalls an occasion on which, during the performance of an abdominal operation, the surgeon was saved from disaster, when he proposed to divide, between ligatures, a structure in the small omentum which was obstructing him, by the observation of a colleague, well-trained in anatomy, "that perhaps it would be wiser not to divide the common bile duct."

At the recent Congress of the Ophthalmological Society, the Bowman Lecture on Ocular Movements, and three other valuable papers demanded a better knowledge of the anatomy of the parts which come within the sphere of the ophthalmic surgeon, than it is feared was possessed by many of the audience; we refer to the paper on drainage of the lacrimal sac, to that on secondary complete removal of the optic nerve after excision of the eye for glioma retinae, and to that on the diagnosis and surgical treatment of supra-sellar meningioma. A second edition of Whitnall's authoritative work is specially valuable, and to be commended enthusiastically to ophthalmic surgeons. The book has been brought thoroughly up to date, at the expense of much labour by the author, and the references to new literary matter are numerous. Colour has been added to many of the old illustrations, and many new ones, also coloured, have been included. The volume now extends to 417 pp. The text has been revised throughout: extensions of knowledge have necessitated a considerable addition to Part III and to the Appendix, Part IV, which treats of the nerves and of their cerebral connexions and destiny. How useful and comprehensive this volume is will be appreciated when it is stated that the latest results of the work of Brouwer and of Le Gros Clark up to 1930 are alluded to, and how arduous has been the work of the author by the fact that a bibliography of 33 pages completes the edition.

Ophthalmic Hospital of the Venerable Order of St. John of Jerusalem. Report for 1931. Chancery of the Order, Clerkenwell, E.C.

The important work carried out at this hospital during 1931 is reported by Lieut.-Colonel Strathearn as in former years. The most notable event of the year was the visit of the Archbishop of Canterbury. Seven-and-a-half centuries ago His Grace's predecessor, Baldwin, visited Jerusalem, since when no Primate of England has visited the Holy City until the visit of Dr. Lang. Baldwin, having entered holy orders, was made Archdeacon of Exeter, but the secular duties were distasteful to him, and he became a monk in the Cistercian Abbey of Ford, Devonshire, of which he was elected abbot within a year. In 1180 he was promoted to the Bishopric of Worcester, and four years later translated by Henry II. to the See of Canterbury. In 1189 he crowned Richard king at Westminster. Baldwin successfully asserted the pre-eminence of the See of Canterbury, forbidding the consecration of the Bishops of England by any other than the Archbishop of Canterbury. He followed King Richard in his crusade to the Holy Land in 1190, and died at the siege of Acre in the same year.

As in biblical times the road from Jerusalem to Jericho has certain dangers. In November last as Lieut.-Colonel and Mrs. Strathearn were motoring from Jericho back to Jerusalem they were held up by a gang of brigands, roughly handled, and stripped of all they possessed.

During the year nearly 19,000 new cases were dealt with of whom more than 12 per cent. were blind in one or both eyes. 190 cataract extractions were performed, and 1,600 operations for trichiasis-entropion.

There has been a considerable rise in the price of foodstuffs, bread having risen 6 per cent., meat 12 per cent., and British imported goods 16 per cent. This, added to the scarcity of water, must make life rather trying in Jerusalem.

A Handbook of Ocular Therapeutics. By SANDFORD R. GIFFORD (Chicago). 262 pages, with 36 engravings. 1932. London: Henry Kimpton. Price, 15s.

Methods of treatment are always open to discussion and the author has endeavoured in writing this book to hold the balance between therapeutic nihilism and over-enthusiastic advocacy of certain procedures. In the main, he considers only such remedies as have proved effective in his own hands or in those of ophthalmologists whose opinion is of value.

The first few chapters of the book deal with methods of treatment, considered as a whole, while the remainder deal systematically with the treatment of diseases affecting the different portions of the eye and its adnexa. In the first portion, a particularly good account is given of physical therapy, including phototherapy, diathermy, massage, and X-rays, and there is an interesting discussion about the optimium pH for lotions and drops. Pilocarpine, for example, is best absorbed at pH 4 to 5, while for atropine, eserine and scopolamine, the optimum reaction is pH 7·5. In the section on vaccines, a full account is given of the skin tests and the therapeutic use of tuberculin accompanied by a somewhat unnecessary picture of five bottles, some vaccine and a syringe.

In a book of this character, it is of course easy to point to omissions, particularly as the practice in different countries is bound to vary. It seemed a little odd, however, to find no mention of leeches in the treatment of acute glaucoma and iritis, and no description of that very useful method of applying heat by "hot bathing" though allusion is made to the frequent use of moist hot packs. In describing the treatment of dendritic keratitis, the author advises against the employment of phenol, a drug, which in this country, is widely used with very satisfactory results. In spite

of these and other points, Gifford's Handbook of Ocular Therapeutics should prove a useful volume to students of ophthalmology and also to those practitioners who, though experienced, may feel they are in danger of slipping into a therapeutic rut. Copper sulphate, for example, has an almost hallowed association with trachoma, dating from the times of ancient Egypt and this, for some reason, seems to prevent its use in other varieties of conjunctivitis. Gifford, however, tells us that he has seen several cases of severe gonorrhoeal ophthalmia under the care of his father which were aborted by one or two applications of blue stone and therefore advocates this method of treatment. It is statements, of which the above is an example, which make this book valuable. It contains much original thought, and is written with zeal tempered by discretion. Its perusal should help those who may have become discouraged by the results of treatment in a disease such as, say, blepharitis or chronic cyclitis, to regain some of their therapeutic optimism and to stimulate to a wider activity those who are content to write month after month, on their out-patients' papers the doleful words, "Rep. Lotio et Ung."

CORRESPONDENCE

To the Editors of THE BRITISH JOURNAL OF OPHTHALMOLOGY.

SIRS,—With reference to your remarks concerning the Annual Report for the Ophthalmic Section, 1930, Department of Public Health, Egypt, published in the *Brit. Jl. of Ophthal.*, Vol. XVI, No. 4, p. 244, I will be thankful if the following remarks are taken into consideration, and the necessary corrections made:

(1) Friday is the only official holiday. Work is not stopped or modified in the hospitals on Sundays.

(2) Regarding the percentage of blindness among hospital cases, it is intended in the future to put down this percentage both including and excluding blindness from cataract cases which have not been operated upon.

Yours faithfully,

E. H. EL MAZINY BEY,
Director, Ophthalmic Hospitals.

NOTES

North of England Ophthalmological Society

AT the Annual Meeting of the North of England Ophthalmological Society on April 8, the following members were elected to the Council for the Session 1932-1933:—*President*, Mr. T. Louis de Courcy, Liverpool; *Vice-President*, Mr. Harry V. White, Manchester; *Members of Council*, Mr. F. B. Chavasse, Liverpool, and Mr. E. F. Wilson, Chester; *Treasurer*, Mr. W. H. Kiep, Bradford; *Secretary*, Mr. Percival J. Hay, Sheffield.

* * * *

International Trachoma Prize

IT will be remembered that the Hungarian Government offered a prize of 2,000 Swiss francs for independent work on the aetiology of trachoma. The assessors were Mr. MacCallan, Dr. Victor Morax, Dr. Maggiore, Dr. Prausnitz and Dr. Emile de Grósz.

The prize is awarded to Dr. U. Lumbroso, of Tunis, and Dr. J. Taboriski, of Palestine, who are bracketed equal. The following, in alphabetical order, receive honorable mention:—Dr. Cattaneo, of Sassari; Dr. Olitsky, of New York; Drs. Röth and Kango, of Budapesth; and Dr. Trapezontzewa, of Moscow.

* * * *

Jewish Health Organization of Great Britain

THE annual report of this Association for the year 1931 has been sent to us. It is of necessity condensed in form to save expense, for, like everybody else at the present time, the organization has had great difficulties to contend with during the year under review. This will be appreciated from the financial statement which shows an increase of expenditure over income from all sources by more than £1,000. At the same time the contributions to the organization have declined by an almost identical amount. The report lays emphasis upon the fact that if existing activities are allowed to lapse, the difficulty of re-establishing them may prove to be insuperable.

The East London Child Guidance clinic is obviously doing a wonderful work. Under school supervision an interesting table is given of cases in 11 Talmud Torahs where 1,075 children were inspected, of whom 172 were referred for physical defects. The greater number of these were of dental origin, but we note that 19 concerned visual defects, and another 36, children who were not wearing glasses which had been prescribed. Under statistical work, we note that Dr. Miller is completing his investigation on mental disorders in Jews and Mr. Arnold Sorsby continues his work on errors of refraction among Jewish children.

Altogether an admirable report, which should direct the attention of the public to the valuable philanthropic work which is being done among the Jewish community.

Oxford Ophthalmological Congress

THE Oxford Ophthalmological Congress will be held on July 7, 8 and 9, at Keble College, Oxford. On Thursday, July 7, there will be a discussion on the Treatment of Non-Paralytic Strabismus, excluding operative details, to be introduced by Dr. Luther Peter, of Philadelphia. This will be followed by two short papers by the same ophthalmologist on the O'Connor Cinch Operation for Squint, and a Satisfactory Recession Suture.

At 2.30 in the afternoon, Dr. Arthur Hall, Professor of Medicine in the University of Sheffield, will give an address with cinematograph illustrations on the Oculo-Gyric Attacks of Chronic Epidemic Encephalitis.

There will probably be a demonstration of the Thomas Photo-electrographe.

Members of the Congress will be entertained at tea in New College by Professor and Mrs. Townsend.

The Annual Dinner will be held in the evening, at Keble College.

On Friday morning, Mr. Zorab will give a paper on Glaucoma Simplex Familialis.

The Doyne Lecture will be given by Professor van der Hoeve, entitled "The Ocular Signs in the Phakomatoses of Bourneville, von Hippel-Lindau, and of Recklinghausen."

This will be followed by a paper by Mr. Burdon Cooper, on some observations in the practice of Refraction.

In the afternoon, Dr. Ronald Canti will give an address and cinematograph demonstration of Living Cells.

In the afternoon, Professor Pascheff, of Sofia, will give a paper on Laws of True Trachoma; to be followed by Mr. George Black on The Treatment of Detached Retina by Multiple Trephining and the Application of Caustic to the Choroid.

In the evening, after dinner, Colonel Wright will give a cinematograph demonstration of the Ophthalmic Clinic, in Madras.

On Saturday morning, the following papers will be given:—Mr. Kay Sharp, on Some Suggestions regarding the Treatment of Amblyopia ex Anopsia; Mr. Lindsay Rea, on a New Cataract Knife; and Mr. Roche, on the Aetiology of Miners' Nystagmus.

FUTURE ARRANGEMENTS

1932

July 7-9.—Oxford Ophthalmological Congress, at Oxford.

July 27-28.—British Medical Association (Centenary Meeting), Section of Ophthalmology, in London.

October 4.—Midland Ophthalmological Society, at Birmingham Eye Hospital.

CONTEMPORARY OPHTHALMIC LITERATURE

Archives of Ophthalmology. *May, 1932.*

LARSSON. Electro-endothermy in detachment of the retina.
SAMUELS. The foundation of the New York Eye and Ear Infirmary.
ABRAHAM. Myasthenia gravis: new diagnostic eye findings with possible pathologic significance.
CARLETON and MADIGAN. Size and shape of ocular images. II. Clinical significance.
WHITE. Hyperphoria. Diagnosis and treatment.
KEY. Extensive iridodialysis: operation, re-attachment. A report of two cases.
KLIEN-MONCREIFF. Isolated foci of calcification in the sclera. Anatomic and clinical aspects.
GIFFORD. Determination of the oxidation-reduction mechanism in the lens of rabbits with naphthalene cataract.
RABKIN. Ophthalmology in Ukraine.

Annales d'Oculistique. *April, 1932.*

CHARLIN. Aetiology of the syndrome of the nasal nerve.
SHOJI. A case of mucocele of the maxillary sinus affecting the eye.
BUSACCA. Extraction of the lens dislocated into the vitreous by preliminary dislocation into the anterior chamber.
GENOT. Three consecutive cases of detached retina cured by the coagulating diathermy current.
TERSON. Improved mechanical treatment of trachoma.
——— On the removal of cysts in the supra-orbital region and certain orbital cysts.
——— Simplified scleral penetration in glaucoma operations.
BICHELONNE. The importance of modelling in ophthalmology.
RIFFAT. Primary sarcoma of the conjunctival fornix recurring at the corneo-scleral junction.

Archives d'Ophtalmologie. *April, 1932.*

GONIN. Thermo-puncture or chemical cauterisation in the treatment of detached retina.
VEIL, DOLLFUS and BOUSSEAU. The results of Gonin's operation in detachment of the retina.
SCHAEFFER. Papilloedema gravidarum with the syndrome of raised intra-cranial tension.
DEDIMOS. Ocular manifestations of paludism.

Revue d'Oto-Neuro-Ophtalmologie. *February, 1932.*

TOURNAY. Cerebral localisations in neuro-ophthalmology.
CAUSSE. Note on rotary opto-kinetic nystagmus.
WEILL and NORDMANN. Supra-sellar tumours commencing with an atypical retrobulbar neuritis.

Archiv für Ophthalmologie.

PILLAT. Anatomico-pathological investigation of conjunctival pigmentation of adults following vitamin A deficiency.
BAB. On allergic diseases of the eye.
SALLMANN. On the embedding of certain metals in the human cornea.
v. HIPPEL. Anatomical investigation of a whole eye with dystrophia epithelialis corneae (Fuchs).

Zeitschrift für Augenheilkunde. *May, 1932.*

BIRCH-HIRSCHFELD. Neo-dym glass.
AVIZONIS. On a spontaneous subsidence of orbital lacrimal glands.
KRASSO. On malignant limbal tumours (abortive forms of rodent ulcer) and their treatment by irradiation.
ENDELMAN. Abortive forms of spring catarrh.

Annali di Ottalmologia e Clinica Oculistica.

November-December, 1931.

CUCCHIA. The behaviour of oblique astigmatism in the accommodating human eye.
SANTONASTASO. Ocular changes in leprosy (*continued*).

Archivio di Ottalmologia. *March, 1932.*

ROSSI. Choline derivatives in ophthalmology.
BARDANZELLU. Clinical contribution to the study of oxycephaly.
CASINI. Spring catarrh and seasonal modifications of the blood eosinophils.

Bollettino d'Oculistica. *April, 1932.*

CATTANEO. Filtrability and ultra-filtrability of the trachoma virus.
QUAGLIO. Researches on the refraction through the posterior surface of the human lens.
PANICO. The reaction of the sedimentation rate of the erythrocytes in ophthalmia.
ACCARDI. A case of progressive degeneration of the macula and its surroundings.
BELLAVIA. On Marcus Gunn's phenomenon.
CONDERO. Varicosity of the optic disc.
REGANATI. Hydrophthalmos in the rabbit's eye.

Lettura Oftalmologica. *March, 1932.*

ZAULI. Ultra-violet rays in the cure of tuberculous conjunctivitis.
GENNARO. A typical case of simple kerato-conjunctival dermoid.

Revista de Ophtalmologia. *March, 1932.*

SZIMANSKI. Surgical treatment of glaucoma.
ANDRADE. Rare forms of ocular Leishmaniasis.
MATTOS. Intra-ocular foreign bodies.

Archivos de Oftalmología Hispano-Americanos. *May, 1932.*

SOURDILLE. Treatment of detachment of the retina.
BLANCO. Our present knowledge of ovarian secretion and its relations with ophthalmology.
CHARLIN. The new syndrome of the nasal nerve and its masked forms.

Boletin de Informacion Oftalmologica.

March-April, 1932.

CHARLIN. Nasal nerve neuritis from general causes.
ONETO. On a case of paralysis of associated movements.
NATALE. Primary adeno-carcinoma of the orbit.
DAMEL. Information useful to uni-ocular patients.

Revista Oto-Neuro-Oftalmologica. *May, 1932.*

WILLIAMS. Orbito-ocular rhinogenous affections.

June, 1932.

PAVIA. The fundus oculi. Its actual recording, photography in colours: an original investigation.
FUCHS. Arterio-sclerosis in general and in the eye.